THE ARCHITECTURAL FORUM

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THE ARCHITECTURAL FORUM

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THE ARCHITECTURAL FORUM
FOR QUARTER CENTURY THE BRICKBUILDER
VOLUME XXXII JANUARY 1920 NUMBER 1

Notes on the Inter-Professional Conference

By ROBERT D. KOHN

AT the close of the fourth session, the organization meeting, of the Inter-Professional Conference, Saturday afternoon, November 29, one of the leading economists of the country, who had been present throughout the two days of meetings, expressed himself as follows: "I have experienced the two most interesting days of my life." There were probably many professional people at that meeting who felt the same way about it. The other expression most common among the people attending all the sessions was this: "The architects of the country certainly rendered a great service to the other professions when they brought them together in this meeting to start this co-operative effort."

The history of the Inter-Professional movement is very brief. The Post-War Committee on Architectural Practice announced in one of its early programs that it desired to bring together representatives of the different professions in order to compare professional standards, to attempt to define the distinctive functions of each profession, to attempt to find means for co-operation between them, and to work jointly toward the betterment of the educational methods now in vogue in the training for the different professions.

Considerable interest was manifested throughout the country in this topic and, accordingly, the executives of the Post-War Committee decided to approach the other professions with a view to forming an Inter-Professional Conference organization to further these ends. A small volunteer committee was formed, representing the law, medicine, engineering, education, architecture and other professions. Invitations were issued broadcast for a meeting to be held in Detroit on the two days following Thanksgiving Day. In view of the haste with which the whole preliminary program was prepared and announcements issued, it was surprising to the promoters to find over a hundred professional people in attendance, representing twelve or fourteen different professions.

Perhaps the most valuable single element that made for the success of these meetings was the opening address of President Kimball of the American Institute of Architects. The keynote of his speech was that this was the beginning of an effort to clarify and to organize that foundation of unselfish service which was essential to professional progress in all fields. The effect of his address was so telling that even those who came out of mere curiosity immediately realized the significance of this new movement, and the speakers for the other professions followed with declarations of interest filled with the same high purpose.

The reports of these addresses will shortly be available. It will suffice here merely to record that in the replies to Mr. Kimball medicine was ably represented by Dr. George E. McKean of Detroit; the law by Dean Henry M. Bates of Ann Arbor; the librarians by Mr. W. W. Bishop of Ann Arbor; dentistry by Dr. W. G. Ebersole of Cleveland; trained nurses by Miss Dora M. Barnes; the professional women by Miss Lena M. Phillips; the woman lawyers by Miss Laula Laddey of Newark, and the mechanical engineers by Mr. Charles Whiting Baker of New York. Equally able expressions of interest in the new movement were delivered by representatives of the state geologists, research scientists, economists and journalists.

The second session of the first day was devoted to the general consideration of plan and scope of the new organization, and ways and means by which it could be supported and its objects furthered. Committees were appointed to prepare reports on these subjects, as well as on matters that might at once become the subject of co-operation between professions.

At the morning session of Saturday, November 29 (the third session), reports of the committees were received and a permanent organization decided upon. The Committee on Plan and Scope presented a declaration of purpose, which after some modifications and considerable debate was accepted in the following form:

"To discover how to liberate the professions from the domination of selfish interest, both within and without the professions; to devise ways and means of better utilizing the professional heritage of knowledge and skill for the benefit of society, and to create relations between the professions leading to this end."

The Committee on Ways and Means recommended that the organization be supported by two classes of membership: a sustaining membership at $10 a year and a general membership with dues of $1 a year. It was also suggested that certain of those present might care to act as underwriters of larger contributions to help the organization in its start. It is interesting to note here that at the closing session more than $1,000 was subscribed toward the preliminary expenses.

It is particularly notable that the conference decided that even in its form it should be of a new type. Instead of having a president and sundry vice-presidents, secretary, treasurer, etc., it was decided that the government of the organization should be through a council of twenty-one, representative of the different professions. The only officer to be known to the public will be the Executive Secretary, who was thereupon elected, as was the Council. The Council elects its own chairman, secretary and treasurer merely for the convenience of Council business. The Council is the sole and the responsible guide of the affairs of the organization.

In planning a scheme of work it was decided that the principal efforts of the organization will have to be made locally. Inter-Professional Conference organizations are to be started in every large community and definite co-operative work organized by these local conferences. The national organization may in the end devote itself mainly to the promotion of these local efforts.

The transactions of the two days of the Detroit conference are to be printed in pamphlet form and will unquestionably give the best record of the purposes of the Inter-Professional Conference and the ways in which they are to be effected.*

As a supplement to the actual report of the meeting, the comments of those who attended the conference are very illuminating. There were frequent expressions of astonishment by representatives of some one of the professions with regard to the enlightened point of view of some other profession. A Cleveland physician got up at one point and said: "I am frank to say that I am surprised and delighted that other professions than my own are interested in this matter of public service. It may have been my own blindness, but I must admit that before this conference I had no idea that the architects and engineers of this country considered their work as a public service; that they are trying to develop the idea of service to the exclusion of selfish interests."

A newspaper man who came to report proceedings and remained to take part in them said: "These meetings have made me want to go out and help organize the journalists of the country into an association with some principles and some measure of recognition of the function of disinterested public service that some of you professional men are trying to realize in your own associations. I intend to try to form such an organization before another annual meeting of this Conference."

In considering the fields of work in which co-operation between the professions would be helpful, it was immediately recognized that the housing movement is an important instance. It needs not only the support and technical knowledge of the architects, but also of the doctors on the side of health; of the engineers on the side of sanitation, water supply, etc.; of the landscape architects on the side of town planning; of the trained nurses on the side of home nursing and the health problems of the family; of dentists on the side of dental hygiene, and of the legal profession to aid in meeting those problems of law which are bound to be involved in any progressive movement of this kind. A medical man present advanced the idea that the help of all these professions was needed in the proper consideration of the public health service. The librarians and teachers called attention to the valuable aid they could render in movements of this kind and in improving technical education generally.* Each profession acknowledged its weakness in effecting the public ends to which it was devoting itself; the suspicion of self-interest to which it was always open, and the invaluable aid that might come from co-operation between professions in meeting these ends.

The Post-War Committee on Architectural Practice may certainly look upon this child of its efforts with great pride. If the Committee accomplishes nothing else, it will have started in this Inter-Professional Conference a movement which, in the opinion of most of those who attended the Detroit meetings, will prove one of the most valuable agencies for efficient government and democracy.

The General Council elected for the first year included: C. T. Chenery, Basil M. Manly and Charles H. Whitaker, Washington, D. C.; Dr. W. G. Ebersole, Cleveland; Dr. Gillette Hayden, Columbus, Ohio; Thomas R. Kimball, Omaha; Paula Laddey, Newark, N. J.; M. B. Medary, Jr., Philadelphia; W. W. Bishop and Dora M. Barnes, Ann Arbor; Frederick L. Ackerman, Felix Adler, Robert D. Kohn, E. J. Mehren, Lena M. Phillips and Calvin W. Rice of New York.

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*Applications for this information should be made to Mrs. Katharine Vassault, Executive Secretary, 56 West 45th Street, New York City.

*Some of the members of the American Institute of Architects mentioned the plan proposed by their Committee on Education to publish popular text books for high school and college use on the significance of the arts. Some librarians present said that their experience would make it possible for them to offer valuable suggestions as to the ways in which such matters could best be presented.

Anchor Cap Company, L. I. City
3.1 acres of floor space
Ballinger & Perrot, Architects

Sears-Roebuck Plant, Philadelphia
For annual business of $50,000,000, cost $7,500,000
George C. Nimmons & Co., Architects

Bunte Candy Factory, Chicago
Reinforced concrete, cost $1,750,000
Richard E. Schmidt, Garden & Martin Architects

Review of Building Activity in 1919

ACCOMPANIED BY ILLUSTRATIONS OF SOME IMPORTANT BUILDINGS NOW UNDER CONSTRUCTION

THE year 1919 has been one of unusual interest to the building industry, and during the past few months perhaps more traditions have been upset and more new ways of approaching problems been required than in any previous year in the history of the United States. The start of the year saw us but lately emerged from the conflict of the great war, and building construction, as far as private operations were concerned, practically at a full stop. Starting from this low level and facing serious conditions in the lack of labor and materials, and with a new and untried price level which was held by many to be prohibitive, activity has constantly increased until with the close of the year a total of investments in building construction has been reached that surpasses any figure on record and shows great promise of continuing into 1920, with indications that the figures will exceed those of last year.

The American Contractor has recently compiled some statistics based on reports from 171 cities, that show a total estimated value of $1,326,936,702 for permits issued, constituting a gain of 198 per cent over a total of $445,549,493 for the same cities in 1918. An analysis of these statistics shows that the culmination of this activity was in August, after which there was a slight recession, with December showing a second upward swing of the curve. Statistics compiled by the F. W. Dodge Company, which include engineering works, show total figures for the country over the first eleven months of the year to be $2,332,902,000 against a total of $1,631,929,000 in 1918, and of the latter, 33 per cent represented Government work largely connected with the war.

A further analysis made by the F. W. Dodge Company shows the building construction of the first nine months of 1919 compared with the total amount

American Chicle Plant, L. I. City
200 by 600 feet, floor space 13 acres
Ballinger & Perrot, Architects

Hydrox Company Plant, Chicago
For soft drinks and ice cream, cost $500,000
Richard E. Schmidt, Garden & Martin, Architects

S. Karpen & Bros., L. I. City
490 feet long and 73 to 135 feet wide
Ballinger & Perrot, Architects

W. H. Schmelzel Warehouse, St. Paul
Cost $75,000
Clarence H. Johnston, Architect

Bridge & Beach Plant, St. Louis
Cost $800,000
Klipstein & Rathmann, Architects

Ramer Candy Co., St. Paul
120 by 140 feet, cost $375,000
Clarence H. Johnston, Architect

Port Morris Holding Co., Bronx, N. Y.
Piano factory, floor space 3 acres
Ballinger & Perrot, Architects

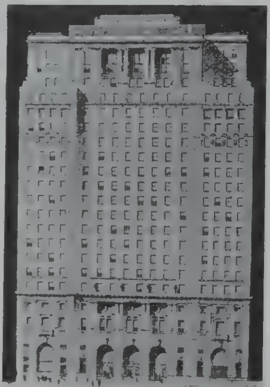
Dixie Terminal, Cincinnati
Office and terminal, cost $2,000,000
Garber & Woodward, Architects

Grinnell Co. Office, Providence
Jackson, Robertson & Adams
Architects

Industrial Trust Bank, Providence
Jackson, Robertson & Adams
Architects

Braunstein-Blatt Store, Phila.
Cost $750,000
Price & McLanahan, Architects

Association Bldg., New York
Starrett & Van Vleck
Architects



Cunard Building, New York
Benjamin W. Morris and Carrère & Hastings, Associate Architects

of construction for each of the ten full years preceding, as indicated in the table below. A great deal of the increase shown in 1919 is, of course, represented by the lower purchasing power of the dollar, but granting this, there is still ample evidence of increased activity.

Year	Greater New York	Philadelphia and Vicinity	Cook County, Illinois
1910	$127,306,500	$32,753,000	$56,093,050
1911	122,886,000	38,924,000	50,845,313
1912	121,206,000	71,366,000	49,524,000
1913	116,683,900	32,633,000	41,029,000
1914	46,261,500	36,784,000	72,096,600
1915	67,164,683	42,001,000	115,144,600
1916	121,279,000	67,020,000	132,275,845
1917	114,182,000	78,695,000	157,258,000
1918	68,105,000	78,305,000	79,153,000
1919 (1st 9 mos.)	204,472,000	81,788,000	127,688,877

These figures are the more astonishing when it is realized that they include but a very small amount of speculative building. The speculator has turned his attention to existing real estate as a more attractive field for quick profits. The figures represent, chiefly, buildings for commercial and industrial expansion, together with housing accommodations and hotels that were forced into erection by pressing needs, and in view of the four years of inactivity it is evident that the potential building demand has been no more than touched. It is estimated that the building requirements of the country at the beginning of this year are in excess of $3,000,000,000.

The remarkable activity in 1919 has taken place in no special areas; it has been general throughout the country. Some cities, however, stand out conspicuously in the great gains, notably Chicago, with a total for the year of over $105,000,000

Hartford Fire Insurance Co. Office, Hartford, Conn.
106,000 square feet of floor space, cost $2,000,000
Parker, Thomas & Rice, Architects; Edwin Sherrill Dodge, Associate

Heyn's Bazaar, Detroit
Cost $400,000
Albert Kahn, Architect

Durant Building, General Motors Company, Detroit, Mich.
Cost $8,000,000
Albert Kahn, Architect

First National Bank, Detroit
Cost $4,000,000
Albert Kahn, Architect

and Greater New York with $251,083,619 compared with $34,792,200 and $68,161,479 — the respective figures in 1918.

In New England, 1919 has exceeded any year since records were first kept in 1901: contracts for October amounted to $32,384,000, of which $7,351,000 was for residential buildings; $13,621,000 for manufacturing buildings, and $6,536,000 for business purposes. General percentages covering the work of the country show residential work to constitute one-third, manufacturing and industrial another third, general business 15 per cent, and public work and utilities 10 per cent. Activity in Manhattan has chiefly been in business structures, but in the other boroughs making up Greater New York the activity has been largely residential. One operation now in the Borough of Queens is the largest single housing development yet undertaken in the vicinity of New York. It is the construction at Broadway-Flushing of 225 single houses at a cost of $12,000 each.

Capital for building seems to be most plentiful in the Middle West, where operations are greatly exceeding all previous figures. Mortgage money, however, in most parts of the country, will undoubtedly remain high, that is, in the neighborhood of 6 per cent, with the exception of some funds for ultra-conservative loans that may be placed at 5½ per cent. Trustees of large estates can no longer afford to loan on mortgage under 6 per cent interest, for with heavy income taxes their net return is below what they can get from investments in tax exempt securities. Another reason is the fact that large insurance companies which have always been a source for building money have invested heavily in Government securities, and as a result will not be prominent in the building money market for some time to come.

Centennial Building, Springfield, Ill.
Cost $1,250,000
Richard E. Schmidt, Garden & Martin, Architects

Live Stock Pavilion, Minnesota State Fair
235 by 400 feet; 1,250 head of cattle, cost $375,000
Clarence H. Johnston, Architect

Much good would ensue to the housing movement if mortgage investments in small sums were exempt from taxation. There is now a bill pending in Congress which provides that income from mortgages not over $40,000 held by individuals shall be exempt from taxation. If such legislation were passed, it would be effective in popularizing mortgage loans and would do more than anything else toward reducing the interest rate.

The high price of building materials has, of course, interfered with carrying out some projects, notably in the case of public work through insufficient appropriations. Recent quotations, however, have shown no evidence of weakening in market prices, practically all commodities showing a steady rise from month to month. The high point is not reached yet, according to some authorities. Production is not catching up with demand to

Chicago Beach Hotel, Chicago
Cost $2,500,000
George C. Nimmons & Co., Architects

Lorraine Hotel, Chicago
Cost $1,000,000
Richard E. Schmidt, Garden & Martin, Architects

Fort Armstrong Theater, Rock Island
Cost $300,000
Cervin & Horn, Architects

Rittenhouse Plaza Hotel, Philadelphia
Cost $2,500,000
Price & McLanahan, Architects

Summit School for Girls, St. Paul
Cost $150,000
Clarence H. Johnston, Architect

Y. M. C. A., Pittsburgh
Cost $225,000
Edward B. Lee, Architect

Maternity Hospital, St. Paul
For Salvation Army, cost $250,000; 150 beds
Clarence H. Johnston, Architect

any appreciable extent; it is restricted through lack of common labor and the difficulty of obtaining raw materials, and in the meanwhile the first spurt of building activity runs beyond the total of the country's biggest year. It is, therefore, generally conceded that the high peak will not be reached until the summer or possibly the fall of 1920.

We recently requested a number of architects to furnish us with perspective views of buildings they had designed that were actually under construction and included in the year's record. The most important of the material received is illustrated herewith. No reference is made to residential work because general interest is greater in commercial and public work. Similarly no reference is made to structures costing less than $100,000, although a large part of the year's figures comprise lesser work, and many offices report that they have an equal amount of building that comes below that figure.

In addition to those buildings illustrated the following indicates activity in various sections of the country. It is not possible to publish perspective views of these buildings, owing to the fact that architects have been affected by a lack of draftsmen and urged on to speed by their clients so that time has not been taken to make rendered drawings.

Albert Kahn, Detroit, Mich., has buildings under construction totaling $23,100,000. Those in addition to the buildings illustrated are:

Crerar Library, Chicago
Office and Library Bldg., cost $1,200,000
Holabird & Roche, Architects

Durant Hotel, Flint, Mich.
Cost $1,200,000
Esenwein & Johnson, Architects

Stacey-Trent Hotel, Trenton
Cost $1,600,000
Esenwein & Johnson, Architects

Kamargo Hotel, Watertown, N. Y.
Cost $650,000
Esenwein & Johnson, Architects

Recreation Building, Easthampton, Mass.
West Boylston Mfg. Co., cost $200,000
Murphy & Dana, Architects

King Edward Hotel, Toronto, Can.
Cost $1,900,000
Esenwein & Johnson, Architects

Social Center Building, Urbana
Wesley Foundation, Univ. of Ill., cost $300,000
Holabird & Roche, Architects


Charles T. Miller Hospital, St. Paul
250 beds, private rooms, cost $900,000. Clarence H. Johnston, Architect


Mary Frances Skiff Hospital, Newton, Ia.
Cost $130,000. Cervin & Horn, Architects

Additions to Packard Motor Car Company Plant, Detroit	$1,000,000
Packard Service Building, Detroit	$500,000
Packard Service Building, Chicago	$600,000
Service Building, Ford Motor Co.	$500,000
Body Building Plant, Ford Motor Co.	$2,000,000
Studebaker Corporation Bldg.	$300,000
Cadillac Motor Company Service Bldg., Detroit	$600,000
Cadillac Motor Company Office Bldg., Detroit	$250,000
Cadillac Motor Company Service Bldg., Chicago	$500,000
Paige Motor Co.	$500,000
Detroit Seamless Steel Tube Company	$500,000
Detroit Creamery Bldg.	$400,000
Fisher Body Company Bldg.	$250,000
Wadsworth Mfg. Co. Bldg.	750,000


Tuberculosis Sanatorium, Memphis, Tenn.
150 bed patients, cost $300,000
Jones & Furbringer, Architects


University of Michigan Hospital, Ann Arbor
Cost $1,500,000
Albert Kahn, Architect

Esenwein & Johnson, Buffalo, N. Y., report the following in addition to those illustrated:

Lafayette High School, Buffalo	$450,000
Hotel Lawrence, Erie, Pa.	260,000
Hotel Windsor, Windsor, Ont.	800,000
Jeweler's Store, Buffalo	110,000

Frank L. Packard, Columbus, O., has work totaling $2,425,000 as follows:

Grocery, George Bobb & Sons Co., Columbus, O.	$240,000
Marting Theater Bldg., Ironton, O.	$150,000
The United States Chain & Forging Co. York, Pa.	$160,000
Moose Club, Lima, O.	$100,000
Millard F. Field Bldg., Ashland, Ky.	$200,000
Addition to High School, Alliance, O.	$400,000
Grade and High School, Miamisburg, O.	$225,000
The Morehouse-Martens Co. Department Store, Columbus, O.	$400,000
John J. Carroll Dept. Store, Newark, O.	$200,000
Administration, Muskingum College, New Concord, O.	$200,000
Office and Bank Bldg., Franklin Loan & Savings Co., Columbus, O.	$150,000

Hentz, Reid & Adler of Atlanta, Ga., have under construction a motion picture theater, $750,000; store building for the George Muse Clothing Co., $300,000, and the Wesley Memorial Hospital located at Emory University, $500,000.

Marshall & Fox, Chicago, Ill., are now erecting the Drake Hotel at North Michigan avenue and Lake Shore drive, Chicago, at an estimated cost of $3,500,000.

George C. Nimmons & Co., Chicago, Ill., have in addition to the buildings illustrated the following:


Nurses' Home, Harper Hospital, Detroit
Cost $550,000. Albert Kahn, Architect


Additions to Evanston Hospital, Evanston, Ill.
Cost $400,000. Richard E. Schmidt, Garden & Martin, Architects

Apartments, Jackson Heights, New York
Andrew J. Thomas, Architect

Map of Lower New York City Showing Reality Sales in 1919

Apartments, Sterling Reality Co., Bronx, N. Y.
Andrew J. Thomas, Architect

Federal Electric Company Building, Chicago, $275,000; Walker Vehicle Company, $280,000; addition to the Wall Paper Building of Sears-Roebuck Company, $400,000; Paint Building, Sears-Roebuck Company, $400,000; Steinhall Mfg. Company Building, $100,000, and the Murray Store and Office Building, Streator, Ill., $200,000.

Allison & Allison, Los Angeles, Calif., have a total of $935,000 for buildings costing in excess of $100,000 each, represented by schools at Merced, Los Angeles, Verbank, Fowler, Santa Monica, Calif. and Chandler, Ariz. also a packing house for Simoneira Company at Santa Paula, Calif., costing $150,000.

Edward B. Lee, Pittsburgh, Pa., has an office building under construction at Port Arthur, Tex., for the Gulf Refining Company, totaling $450,000, the Y. M. C. A. in Pittsburgh, costing $225,000, and the School of Dentistry at the University of Pittsburgh, estimated at $550,000.

Tooker & Marsh, New York, N. Y., have four public school buildings, totaling $935,000, and are now working on a $400,000 program for school buildings for the city of Norwich, N. Y.

Of Boston architects, Maginnis & Walsh are building at Scranton, Pa., the Venard Apostolic School, at a cost of $250,000; R. Clipston Sturgis has under construction the Bird School, East Walpole, Mass., costing $135,000; and Parker, Thomas & Rice have, in addition to the Hartford Fire Insurance Building illustrated, a building for the New England Telephone & Telegraph Company, costing $600,000; and in their Baltimore office have an addition to St. Bartholomew's Hospital, New York, totaling $200,000, and the Ober Office Building, Baltimore, $150,000.

The soundness of the present activity in building construction is shown by the unprecedented real estate situation in lower New York City. Here there has been very great activity, as may be seen from a glance at the map reproduced. Many of the larger buildings have been acquired by large corporations for offices and have thus been permanently taken out of the market. Many office buildings, apartments and hotels are now under construction; but it will be years before the demand in New York will be met, even with most intensive building. In the meantime, property values and rentals have advanced beyond the expectations of the most optimistic real estate operator.

The prospects for 1920 are that the larger cities will see tremendous activity in the construction of apartments and residential hotels, with housing and schools prominent in all localities. A significant sign is the greater participation the public is taking in the financing of big building operations. Through the medium of bond houses, bonds issued against guaranteed mortgages are being sold to the public, and in that way a new and very large reservoir for construction money has been opened.

Group of Small Apartments, Akron, Ohio
Andrew J. Thomas, Architect

Housing Development, Easthampton, Mass.
West Boylston Mfg. Co., 146 houses, cost $4,000 each. Murphy & Dana, Architects

The Kitchenette Apartment

I. PLAN AND GENERAL CONSIDERATIONS

By CARL A. ERIKSON
of Richard E. Schmidt, Garden & Martin, Architects

THE housing expert, the sociologist, the economist and other highbrows will unanimously agree that these apartments are a vicious, unhealthy, debasing offspring of our equally-to-be-condemned industrial civilization. This may be admitted while we wait with baited breath on each new Industrial Conference to solve the problem — with more words.

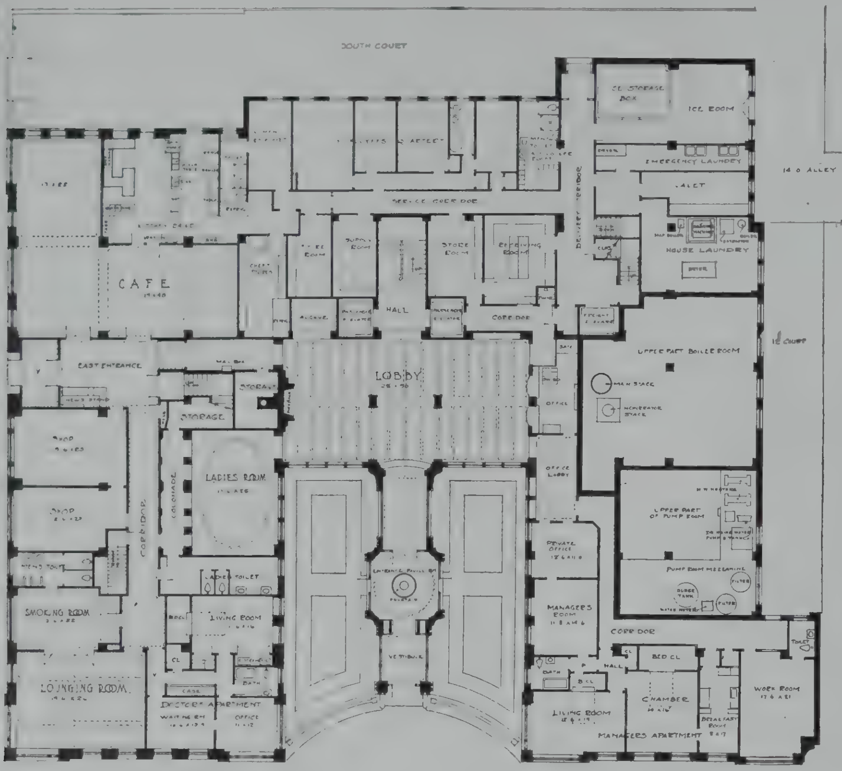
In the meantime we, as architects, are faced by a double barreled demand. From the invēstors, a demand for returns commensurate with the increased cost of building; from the tenants, a demand for cheaper housing, surcease from the problem of domestic help, and for greater ease of living. To these the "kitchenette" apartment offers a solution. We may regret the use of the "condensed" apartments, but we can't stop it — at least, not until after the various Conferences have rendered their decision, so let us use our most intelligent effort toward solving the peculiar problems involved by methods ready to hand.

The "condensed" or kitchenette apartment in its essentials consists of a living room with a concealed bed, a bath, a dressing closet; and, in one room, a tiny kitchen and dining room. It is obvious that the two rooms function as four; and in Chicago the rentals are in the latter proportion if not greater. Therein lies its popularity with both tenant and landlord: two rooms require less attention than four; two rooms cost less to build than four and yield the same return. "Q.E.D."

Not quite as favorable is the report from the standpoint of public policy. These apartments do increase the congestion, for two apartments flower where only one bloomed before. Debating the question as to whether this isn't a cause rather than an effect may be as futile as the historic debate as to the precedence of the chicken or the egg.

We have become so accustomed to sleeping and

The Surf Apartment Hotel, Chicago, Ill.
J. A. Armstrong, Architect

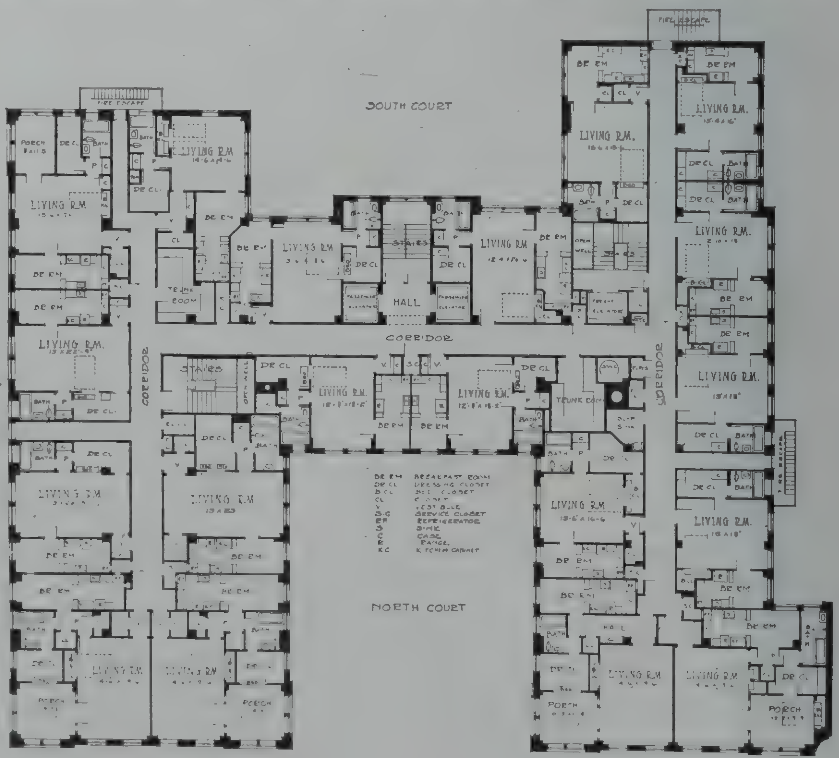


First Floor Plan of Surf Apartment Hotel, Chicago, Ill.

lounging in separate rooms that we are very apt to condemn these apartments as being a menace to the health of the occupants. But why should it be? In these quarters every inducement is offered to "throw open the window and influenza" by the convenient and heated dressing room adjacent — a luxury only a few of the more expensive houses afford. In addition, the vent ducts from the kitchenettes, the bed closet and the dressing room insure a constant movement of air through the apartment, even though the windows be closed. It might be objected that it is unhealthy to sleep in a bed that has remained cooped up in a closet, no matter how well ventilated. This has some merit to it, but the careful management will see that the beds are properly aired and "sunshined" at intervals; about all that the most careful housewife does. With the change of tenants, it is imperative, of course, that the entire apartment and its furnishings be thoroughly cleaned, especially the mattress and pillows.

Children are not wanted, though they are usually tolerated. One might argue that these buildings would, therefore, tend to decrease the birth rate. This is probably arguing backwards again: children aren't born into this world to fill rooms, at least not in the economic strata in which these buildings function. The typically American decline of a neighborhood from "plutocratic" to "bourgeois," and from "bourgeois" to "proletariat" and then to slums, will have what effect on these apartments? Surely the menace of unhealthy living conditions is reduced to the minimum; the rooms are large with large window area. The toilet facilities are convenient and ample. Care will be needed to insure that the large dressing closets are not used as sleeping quarters or that they do not become pest holes. Even this is minimized to some extent by the ventilating ducts which will exhaust some air from these places whether fans are used or not. On the whole they will be far better slums than the old type apartment, housing many families in what was intended for one.

At the present time the kitchenette building or



Typical Floor Plan of Surf Apartment Hotel, Chicago, Ill.
Corner Apartments with Sun-Room rent for $300 per Month.
J. A. Armstrong, Architect

"bedhouse" has almost swept the ordinary type of apartment from the boards, for it is difficult to convince the loan brokers that high enough rentals are possible for the former type of building to warrant the necessarily large loan. In this newer type the evidence is everywhere at hand that it is possible to show a very remunerative return on the investment. In Chicago they have lived through only one crisis — that attendant upon our entering the war. The experience during this period indicates a smaller loss through vacancies than of any other type of dwelling. Whether the high rentals now possible will continue after the present congestion has been relieved, is problematical. In most buildings the rentals are at such high figures that a considerable reduction is possible without bringing the return down to that of the ordinary apartment building. When the investment return sinks below that of the apartment house, the pendulum will swing back again. Maintenance costs will depend entirely on the kind of service given; where the apartments are let unfurnished and without delivery service, they will be less per apartment, but greater per square foot, than the older type. Where they are let furnished and with hotel service rentals are higher, and so, too, the depreciation, maintenance and service costs.

The continuance of a healthy condition of the balance sheet depends largely on whether or not they fill a lasting demand by the public. Here it may be well to digress a minute or two to consider the pedigree (would family tree be the better word?) of this "new fangled critter."

Lest any one be misled, let me hasten to disclaim that these buildings are not redolent with "the Spirit of the Prairies" nor a product of Chicago's "Indigenous Architecture" factories. They probably have a pedigree reaching back to the monkey era; but in this paper it will be unnecessary to go farther back than, say, Marcus Aurelius. When the retired (always synonymous with wealthy or at least well-to-do) slave merchant hied himself to the Los Angeles of the day, he preferred to leave as many of his servants behind as possible, as this eased his and Mrs. Slave Merchant's mind of domestic cares, and his thrifty eye was well pleased. There were others, too, in imperial Rome who, because of the acute housing shortage, lived in "light housekeeping" rooms, or, perhaps, even in the hostels, prepared a light breakfast over the charcoal brazier.

View in Lobby of Surf Apartment Hotel

Having given these apartments a background, let's skip the intervening period and return to their rebirth in California, the playground of the superannuated, the young, — the maiden aunts, the school teachers and the "tired" business man. Here the demand for furnished apartments was insatiable; the leases were necessarily for a short term; domestic cares were a bugaboo, and yet the thrifty Yankees wanted to prepare their own coffee for breakfast.

We may remember the folding bed of years ago — some may remember the tales of the people who were hastened into the next life when the thing inconsiderately closed upon them. It seems to have gone into the attic with the pot bellied stove and the walnut furniture. The maiden aunts and the grandmothers needs must have a place to entertain. The bedroom, never! The hotel lobbies, too public. So comes the development of the concealed bed. The unfortunate city dweller is already familiar with the unsuspectingly hard Davenport, which is

Roof Garden of Surf Apartment Hotel

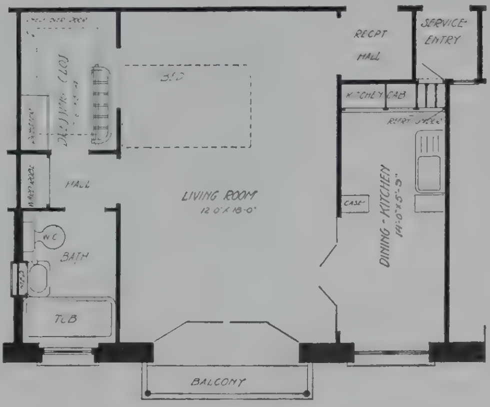


Fig. 1. Plan of Two-Room Unit

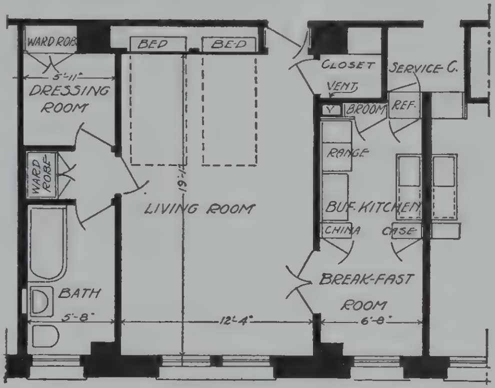


Fig. 2. Twin Bed Unit for Fireproof Building

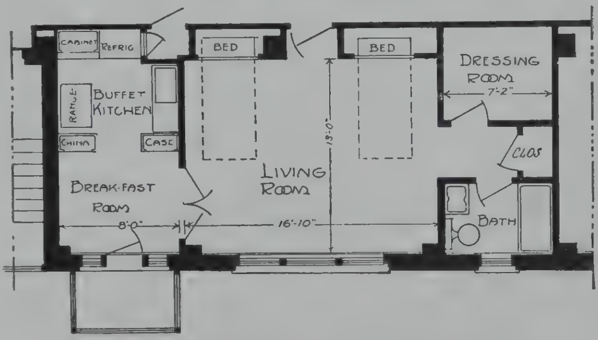


Fig. 3. Twin Bed Unit for Shallow Depth in Plan

"so convenient when guests drop in"; with the comfortable fireside chair which embowels a bed, and, perhaps, with the "Adam" library table where the midnight oil is transmuted into midnight snores. The tales told by the loiterers in our Mecca of how the bed escaped censure by discreetly hiding behind a buffet (household variety) or sliding carelessly under the dining room — require almost a childlike credence. However, our "very best people" will vouch for even greater acrobatics on the part of that deceiver.

Mecca, and then Paradise for the true believers of the Prophet; so with our friends —California—and—what *does* come after that? Gradually the idea became familiar to the effete East (*sic* Chicago), and a few courageous builders ventured their shekels and won. Now "everybody's doing it."

The first reason for the growing popularity of these apartments is the shortage of domestic help and the unsatisfactory quality of what there is. This makes it imperative that "milady" reduce the work around her quarters to a minimum, lest, through her enforced labors, she "reduces" without the strenuous, but genteel, exercises of the beauty columns. For such as she these apartments offer an almost complete escape from menial tasks. In the larger, and more elaborately appointed, apartments the service extends to caring for the rooms and making the beds. If desired, "milady" may have her tea and toast in bed served from the main kitchen; she may have expert maid service, and hairdressers, manicurists and beauty specialists are at her beck and call. The service furnished by such apartments as the "Surf" is equal to that in the very best hotels.

Some question has been raised as to whether the high class apartment of this type will continue to be popular with the people who can pay from $100 to $300 per month for these rooms. Men experienced in the management of the residential or family hotel agree that the kitchenette and its "diningette" twin fill a very real demand. All of us like some dishes prepared in a special way — a way that cannot be accomplished in the hotel. Mr. Statler has tried to meet this need in the new Pennsylvania Hotel by providing a "homecooking kitchen." His success is problematical. Further, all of us, at times, would like a change from the hotel cooking — "home" (or otherwise); sometimes we do wish to avoid inspection by the alert captains, waiters, bus-boys and fellow-patrons; we don't always like to dress for dinner (especially the ladies), and on Sunday "mornin'" how we do hate to get up for breakfast! In spite of much comment to the contrary, it is pretty well established that the plutocrats are like the rest of us and occasionally want to get a "snack" for their friends in the privacy of their own rooms without the assistance of the obsequious waiter. They don't wish to do all their entertaining in the public lobbies, nor do many of them care for their bedrooms as places of entertainment. The kitchenette apartment of the better grade solves both problems. Dine when, where and how one wishes. The concealed bed makes the extra room (and extra rental) unnecessary.

Another reason for the popularity of the kitchenette with the tenant is the tendency to visit summer and winter resorts. As Chicago bids farewell to its own families which flock farther north, it greets a numerous and constantly increasing colony of summer guests. Leases can usually be arranged for any length of time so that these buildings fit well into this nomadic life.

All of the plans presented are of buildings in Chicago, and it is necessary to understand some parts of the Chicago Building Code to understand the plans. Building and health departments of the city have "ruled" that these buildings are

apartments and not hotels, and therefore must comply in every respect with the code for buildings of Class VI. In most respects this is a very salutary proceeding, for in the apartment code minimum sizes of courts, vent shafts, etc., are specified; while for hotels the code is very indefinite on many of these points. It needs no great perspicuity to see that in kitchenette apartments the percentage of unoccupied area, sizes of courts, etc., should be greater than for the ordinary apartment building. In one respect this ruling is a distinct hardship to the property owner, for an apartment building may be only "1½ times as high as the widest street on which it abuts" — a hotel, however, must *not* exceed 200 feet in height. Is there any gain to the community in building residential hotels 200 feet high, without the safeguards to the health of the occupants afforded under the tenement house ordinance, and restricting the apartment hotel? In another phase the ruling is more questionable: a hotel may have inside bathrooms with exhaust ventilation; apartment house bathrooms must have "at least one window with a glass area of six square feet and a minimum width of one foot opening into a street, alley, yard, court or vent shaft." The result has been that the dressing closets are usually back of the bathrooms in dark, unhealthy closets. Would it not add to the "health, welfare and happiness" of the community to place the dressing closet (frequently containing the bed) on the outside, giving it sunlight and natural ventilation, and require the bathroom to have a mechanical exhaust? An ordinance has been introduced in the Chicago Council requiring that bed closets shall have a window; whether the scheme suggested would not be equally satisfactory, is debatable.

It is also necessary to bear in mind that "apartment houses, flats or tenements" may be built of ordinary (*i.e.*, brick walls and wood joists) construction, up to three stories in height, provided that each apartment is divided from every other on the same floor by a brick wall, and that each has direct access to two stairs. This will account for the radical difference in plan between the three-story buildings and the higher ones which are invariably fireproof. In the first type the stairways are numerous and occupy an unusually large percentage of the ground area. At the present lumber prices the cost of this type of building is probably almost as great per cubic foot and per apartment as a similar building of fireproof construction of the corridor type.

The "ordinary" construction buildings are usually without maid service. Packages are delivered at the rear entrance and garbage removed by the janitor. In either class of buildings, furnished or unfurnished apartments may be had. However, they are usually furnished, and whereever rentals are quoted they are for furnished apartments unless otherwise stated. Beds, of course, are always included.

Much of the success of these apartments will depend on the bed, concealed, of course. An uncomfortable one, or one whose concealment is difficult or attended by many "contraptions," would soon make the apartments tenantless. That the bed manufacturers have succeeded in eliminating awkward mechanical contrivances and, at the same time, making a comfortable bed is assured by the popularity of the high priced apartments. When the bed is down it has the appearance of an ordinary bed, even to the conventional head and foot ends, which have here even less than the usual justification. The springs are usually wire fabric; in the better ones, with coil springs below the fabric. The weight of the conventional box spring militates against its use, but with keen competition the manufacturers will probably soon develop a satisfactory box spring. To conceal the bed, it is necessary to raise the foot end and after it is in a vertical position to swing it around into its hiding place. This is easily done because of the simple mechanical contrivances on the bed. One type of bed is fastened to the door, which pivots with it but not on it; in another type the door must be opened first and the bed may then be swung around on its arm. Minimum clearances, etc., may be obtained from the manufacturers. Beds are, of course, made in all the usual

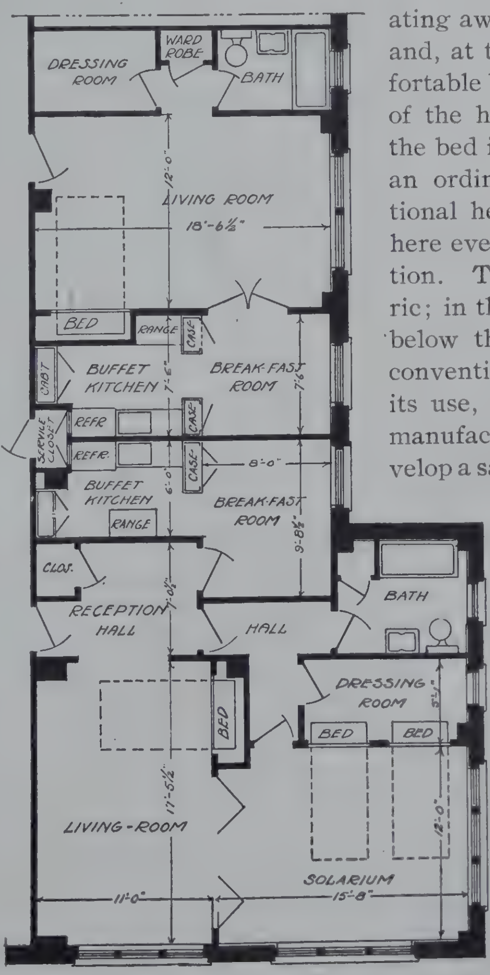


Fig. 4. Portion of Plan Showing Two Apartments, the Solarium Affording Additional Bed Space

Fig. 5. Living Room in Surf Apartment Hotel

sizes: 3 feet, 3 feet 6 inches, 4 feet and 4 feet 6 inches wide.

The bed's position, both day and night, is clearly indicated on the plans of various units (Figs. 1, 2, 3 and 4). These are only a few of the infinite varieties of plans that will suggest themselves to the ingenious architect. These plans have all been tried and found to be satisfactory and economical. The tiny reception hall indicated in Fig. 1 has been found to be very desirable as adding an element of privacy to the apartment. Here it would be well to have a coat closet or wardrobe. It is usually more desirable to have the beds in separate closets, as in Figs. 2 and 3, rather than in dressing room, as in Fig. 1. All of these plans may be severely condemned as lacking in adequate closet space — a necessity recognized in all family hotels, but not yet fully appreciated by the majority of architects of these buildings.

It will be seen that the living room-bedroom is larger than the usual hotel room. In its furnishings the room does not belie its name (Fig. 5) and gives no hint of the bed. Fig. 6 shows the bed down with a glimpse of the dressing closet and the bathroom. Fig. 7 shows a room in which the door pivots with the bed, and serves to indicate character of the appointments better than any description would. From this class of furnishing the apartments run the entire scale — downward.

Fig. 7. Arrangement with Special Closet for Bed, Surf Apartment Hotel

To enter the dressing room when the bed is up it is necessary to pass through the hall. When this is omitted the effectiveness of the unit is lessened a great deal, for the dressing closet and bath are then to all intents and purposes one room. In this hallway is placed a cabinet with one or two drawers for linen, a wardrobe, and another wardrobe above for off-season clothing.

The dressing closet explains itself. A great deal of ingenuity has been exercised in these rooms to make them more convenient and at the same time enable the tenant to store away more goods. In some apartments a dressing table and a "chiffo-robe" is provided instead of the dresser. Hanging rods are usually provided close to the ceiling with special hangers so that the upper space may be used. Special designs have been made for the furniture to insure that every want of man and his mate may be met. Care should be taken in this room to insure good artificial light at the dresser. Plugs or receptacles should be provided for the inevitable curling iron. This room must be ventilated, preferably by exhaust fans, and arrangements should be made in the doors to the bathroom and hall to insure a supply of air.

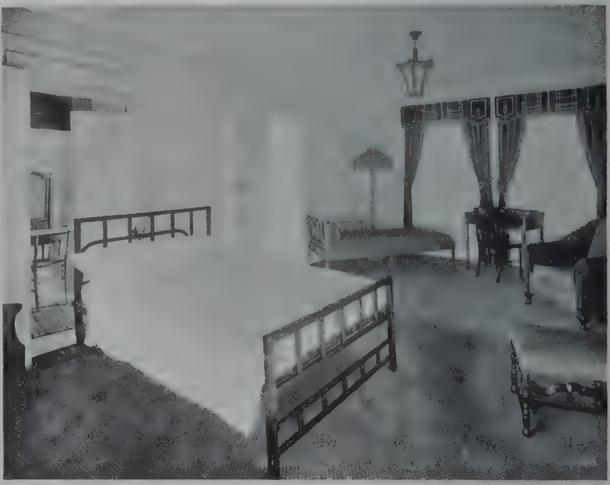


Fig. 6. Arrangement with Bed Pivoting into Dressing Closet, Surf Apartment Hotel

The bathroom needs no comment, though it is not to be denied that many an apartment is rented on the strength of the "pi-dis-tal bowl." The one illustrated is the most economical in space, but some might consider it worth while to have it so arranged that it would be unnecessary to step into the tub to open the window. A shower over the tub is a very desirable feature, and the bath tub under the window makes this rather awkward.

Tuberculosis Sanatorium at Mount McGregor, N. Y.

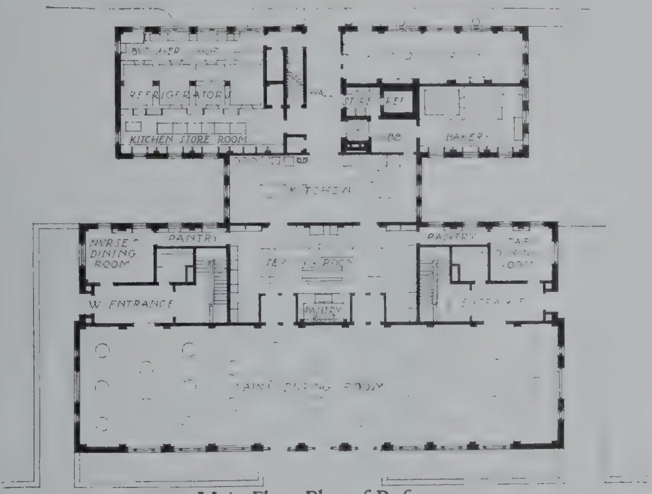
FOR THE EMPLOYEES OF THE METROPOLITAN LIFE INSURANCE COMPANY

D. EVERETT WAID, ARCHITECT

THE growth of industrial and other corporations in the United States during the last few decades to a point where the people employed by a single establishment number in the thousands, has gradually brought about a feeling of responsibility on the part of such corporations to their employees with respect to health and general welfare. This movement is to be heartily commended from a humanitarian standpoint, and it is not without its benefits from an economic standpoint as well, for it is necessary for the successful conduct of business to-day to have continuous and efficient effort, and this can only be had when all employees are in good physical condition and are assured pleasant recreation in their leisure hours.

One of the most carefully planned and conducted establishments for the benefit of employees is that of the Metropolitan Life Insurance Company in its large sanatorium at Mount McGregor, N. Y., located nine miles north of Saratoga Springs. The property has a commanding site comprising 500 acres, not including a large farm that is operated in connection with the institution. Looking toward the west from the sanatorium are the foothills of the Adirondacks; to the south, Saratoga Lake and the Catskills; to the east, Bemis Heights where one of the Revolutionary battles was fought, and in the distance the Green Mountains. The lake about which the group of buildings has been constructed is 1,046 feet above the sea level.

At the beginning of the project it was planned to care only for employees suffering from tuberculosis, and the site was selected in view of the qualifications best suited to the treatment of this disease. The plan had its inception in the winter



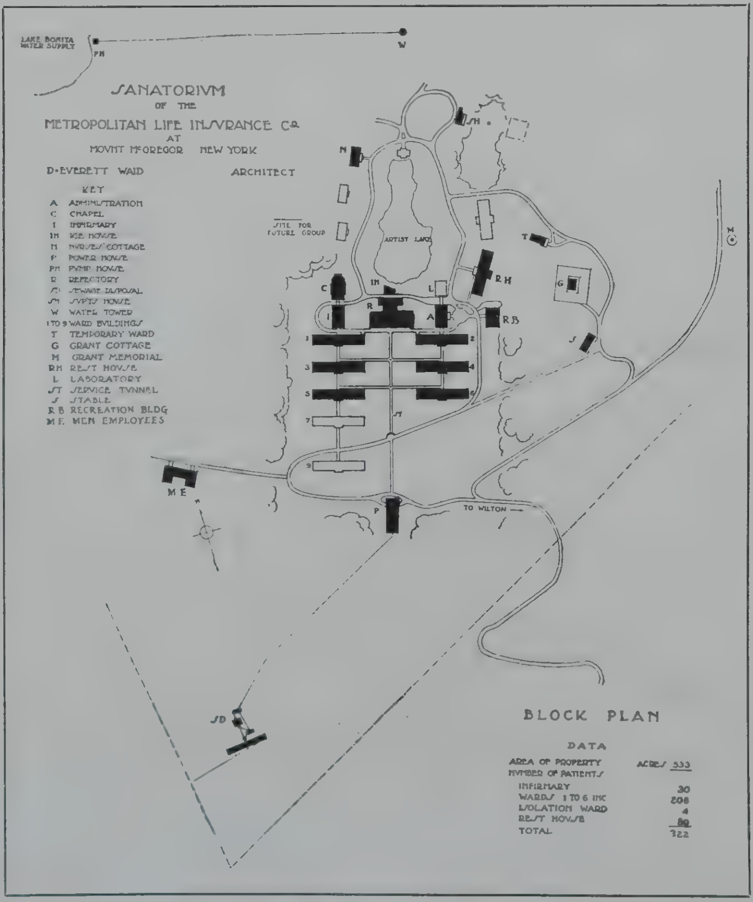
Main Floor Plan of Refectory

View Looking Up Path on Main Axis toward Refectory. The Tunnel Connecting Refectory and Power House Is Beneath This Walk

View of Model Showing All Buildings Erected to Date

of 1908–9 at the time of the exhibition of the International Tuberculosis Congress in New York. A proposal following this exhibition that the Insurance Company should build and maintain a tuberculosis sanatorium for its employees met with the favor of the officers, and steps were taken to secure the consent of the state insurance department. There was some doubt expressed as to the right of an insurance company to enter into such a transaction, and the question was submitted to the Supreme Court, which declared that it was not only the right, but the duty, of such a corporation to take reasonable care of its employees without consultation with the stockholders.

The employees of the Insurance Company number 16,000, and the plan of the group was arranged to provide accommodations for the number of tuberculosis cases arising among that number of people. The general treatment as followed in the sanatorium for the disease consists of rest, fresh air, diet and graduated exercise. The incoming patients are provided with single rooms in the infirmary until diagnosis is complete and constant bed treatment is found unnecessary. As recovery takes place the patient is removed to one of the ward buildings in the upper tier, which are provided with a diet kitchen, making possible continued or partial bed treatment when necessary. As recovery progresses the patient is moved to the lower wards, which are connected to the upper ones and the central group of buildings by inclined walks, so that by this means the strength of the patient gradually increases to meet the demands made on it. There are, however, in the vicinity of each of the buildings, level walks to provide exercise for patients whose condition will not permit climbing the grades. Extended roads lead to the surrounding woods and neighboring lakes. The main road leading to the sanatorium ascends for a distance of a mile, making grades varying from 6 to 10 per cent, which provide a means of testing the walking ability of patients before releasing them to return to their regular duties. This sanatorium is one of the few in the country from which patients may resume regular work after being discharged. It is possible, owing to the limited kinds of work that the employees ordinarily pursue, to provide them with such training during their convalescent period as will best prepare them for future work. The sanatorium has not been in operation long enough to prove the permanence of this preparatory treatment, but it has been demonstrated that the patient is able



General Plot Plan of Sanatorium Property

to resume normal working conditions with the minimum of mental and physical effort and loss of weight, which are commonly experienced by recovered patients.

The sanatorium was opened to receive patients in November, 1913, but all of the wards and the administration building were not at that time erected. The group of buildings is now practically complete and is capable of accommodating 322 patients. The institution was not long in operation when it was realized that employees with other diseases would be benefited by the kind of treatment provided, and during the first year a few cases other than tuberculosis were brought to the sanatorium, and sufficiently good results were obtained to warrant the erection of a separate building for them, called "The Rest House," with accommodations for 80 patients. This building provides single rooms for such patients as require isolation, and double rooms and two dormitories for others.

View Looking Southeast across Slope of Hill

The sanatorium consists of a group of three main buildings: administration, refectory and infirmary, with the patient's buildings, the several open wards and the rest house located on the southern slope of the site exposed to the prevailing southern breeze of summer and protected by the mountains and forest from the northern storms of winter. Although the buildings are located at different levels, they are so connected with graded walks that it is possible for a wheel chair or food cart to be run from any ward bed to the dining room or kitchen without passing a step.

The main driveway in front of the refectory is covered and connects the five central buildings, providing a level and dry outdoor walk in stormy weather and in fair weather an elevated terrace from which a magnificent panorama may be viewed. The ward buildings are a development of the so-called "shack" type of tuberculosis shelter. The patients' reclining chairs and beds are always out of doors but under roof. Each of the alcoves accommodates two beds, and at the rear of each space is a dressing room for two patients with a toilet between each two dressing rooms.

View toward the South from the Ward Buildings

The alcoves were designed with a view of providing doors to close them, but in practice it has been found that, even in the most severe weather, they are unnecessary. Over each bed is a skylight with a non-closing ventilator which floods the bed with sunshine and also assures constant, upward circulation of air. The space immediately in front of the alcoves is enclosed with fly screens and provided with a low balustrade to protect the interior from driving rain and snow. The central portion of each ward building contains a social room and two tub bathrooms.

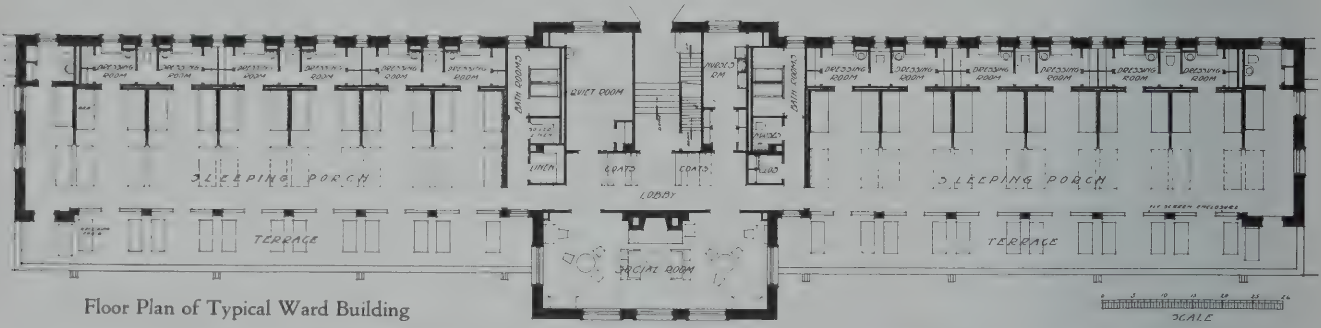
The administration building provides space for the physician in charge, his assistants, the business manager and clerical assistants. Adjoining

Rest House as Seen across Artist Lake

the main reception room are examination rooms with facilities for examining a large number of patients in the shortest space of time. The pharmacy from which medicines are distributed is located in the ground story, and here also is the hydrotherapeutic department with dressing rooms, steam heated cabinets, etc., planned to facilitate the use of this treatment. The upper portion of the building contains rooms for the members of the staff and guests, and a library and sitting room for their use.

The central and largest building of the group is the refectory, the ground floor of which is devoted to the use of convalescent patients in workrooms, library, etc., and also a press room for *The Optimist*, a weekly paper published by the patients. The front portion of the main floor of this building is devoted to the dining room—a room 32 feet wide and 132 feet long, with a vaulted ceiling 24½ feet high, and a range of windows commanding a view of the Hudson Valley and Saratoga Lake to the south. In the center of the building is a large double serving room and back of this are the kitchen and its dependencies. The second floor portion back of the dining room is set apart for female helps' sleeping quarters, and above this dormitory is an isolation ward with outside stairway designed to accommodate a nurse and three or four patients. Across the drive from the service portion of the refectory is the icehouse, adjacent to Artist Lake from which the supply is taken. This building has a capacity of 500 tons.

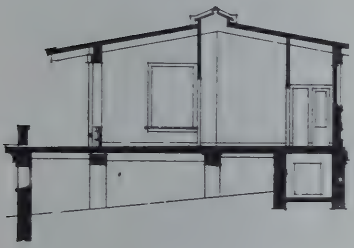
The infirmary, which is west of the refectory, contains in the basement on the level with the driveway at the south, waiting rooms, X-ray and drug room, autopsy room, etc. The first story on a level with the drive on the north contains, aside from separate bedrooms for incoming patients, a diet kitchen and surgical dressing room. The second story is similar to the first, but has in addition a serving room and small laboratory. A distinctive feature of the infirmary is the method



Floor Plan of Typical Ward Building

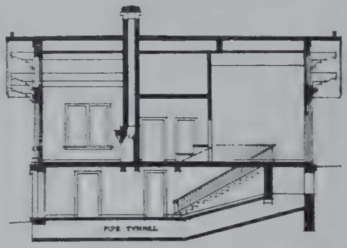
View of East Group of Ward Buildings from Main Driveway

View Looking Up Main Driveway Showing Ward Buildings at Left and Recreation Building at Right



Cross Section through Dormitory Wings of Ward Buildings

Main Floor Plan of Infirmary



Section on Axis through Central Pavilion of Ward Buildings

of opening the entire exterior end of each room to the outer air, protecting it with louver shutters which permit free passage of air, but keep out to some extent the sun, rain and snow. If necessary, the windows can be closed and the room of the patient heated. At the rear of each patient's bed glazed doors enclose a portion of the room, which in cold weather is heated and used for meals, bathing and dressing.

The most recent addition to the group is the recreation building at the crest of the hill on the right of the entrance drive. It has a large auditorium suited to concerts and other entertainments at which the convalescent patients may gather.

The chapel is connected by a glass enclosed passage with the infirmary, from which bed patients may be wheeled into the gallery. A resident chaplain is provided with sitting room, bedroom and bath, in connection with the chapel.

The power house is located at the southern extremity of the plot and on the main axis of the refectory building. It contains the boilers and engine room, boiler feed pumps, emergency water supply pump and electric transformers, with space for possible future electric generators. Coal is delivered by motor truck into bins with a capacity of 700 tons, and finds its way by gravity from the driveway to the front of the boilers. Above the boiler room there is a fully equipped laundry and sterilizing room. The upper story of this building is a dormitory for male help, which has in addition a common sitting room. The lower floor of the building provides a garage and repair shop. The stack is built of solid concrete blocks reinforced horizontally and vertically with steel bars. Its inside diameter is 5 feet and it extends 175 feet above the boiler room floor.

A tunnel leads from the laundry floor of the power building up the hill to the refectory, a distance of 750 feet. An electric railway carries laundry work and supplies between the buildings, and in stormy weather, employees may use the tunnel as a passage. The tunnel, furthermore, contains pipe galleries for steam, water and drainage pipes, electric cables, etc., and from it branches are carried through underground conduits to the several buildings.

At the upper end of the lake and on the north-

west side is the nurses' cottage, within easy walking distance of the main group. Each nurse is provided with a single bedroom or sitting room if she prefers to use the common sleeping porch. A comfortable living room is a part of the first floor, which provides a center for the social recreation of the staff.

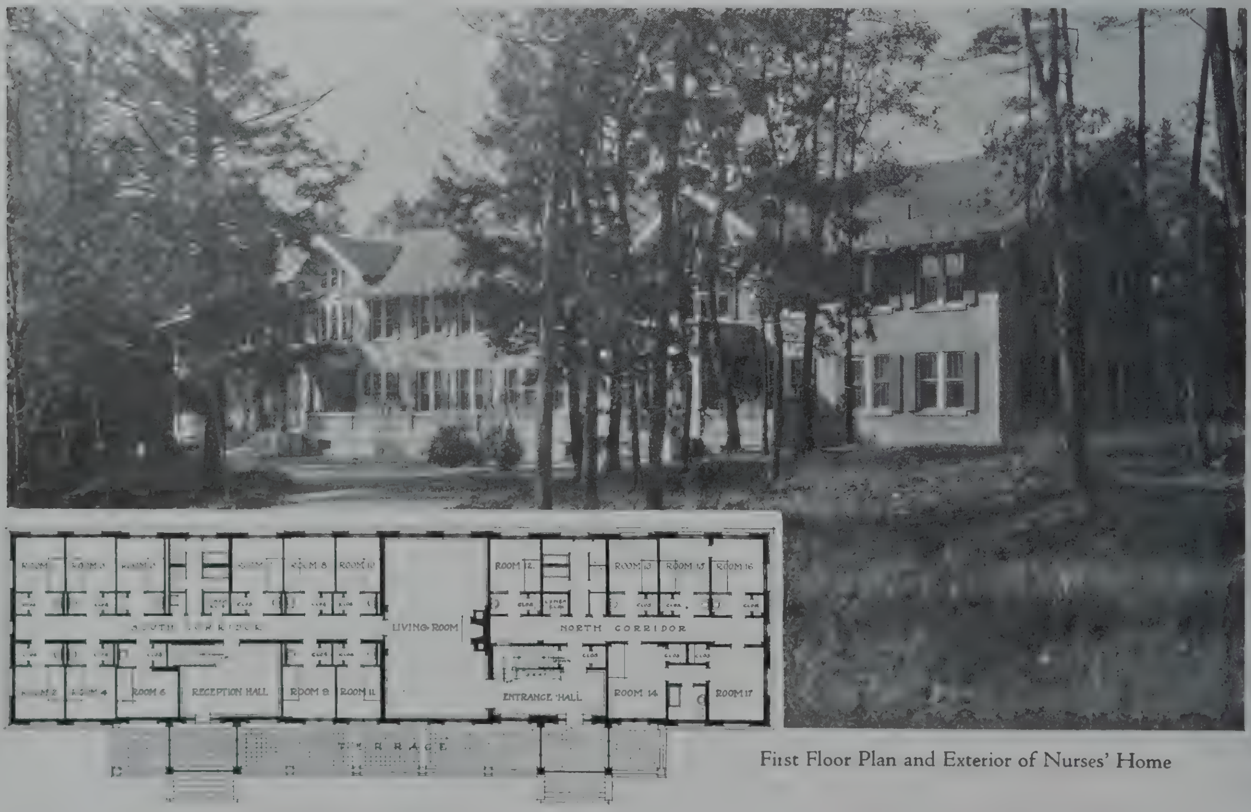

View of Power House from Upper Level

At the north is a reinforced concrete, 50,000 gallon water storage tank supported on a stone tower. The supply is taken from Lake Bonita, nearly a mile to the west, where it is treated with chlorin gas and from which it is pumped by gasoline pump to the water tower, aerated and filtered, and then distributed by gravity.

The sewage disposal plant is located at the lowest part of the site, well away from the buildings, and consists of settling tanks, sprinkling filter, sludge bed and sand filter beds. The effluent is treated finally with chlorin before it is passed into the neighboring stream. Electricity for light and power is obtained from the transformer station of the electric railroad in the neighboring town of Wilton. Hot water heating is used throughout the group, the water being pumped from the central plant through the tunnel and branches. The boilers also generate high pressure steam for sterilizing and use in the laundry, kitchen and various serving rooms.

The buildings have foundation walls of rubble stone, which was quarried on the site. The upper walls are of hollow tile with stucco surface. All floors and roofs are reinforced concrete, the roofs being covered with red tile. The finished floors in general are of Portland cement concrete, with the exception of the toilet rooms, which have vitrified white tile floors, the kitchen where green slate is used, the corridors which are covered with linoleum laid on the concrete, and the bedrooms of the rest house which have composition flooring.

An interesting fact in connection with the sanatorium is that the cottage in which General Grant died stands in the midst of the sanatorium property. The Metropolitan Life Insurance Company has erected on the brink of the cliff where General Grant had his last view of the valley, a memorial slab with suitable inscription.



First Floor Plan and Exterior of Nurses' Home

TWO VIEWS OF THE CHAPEL

SANATORIUM FOR THE METROPOLITAN LIFE INSURANCE CO., MOUNT McGREGOR, N. Y.

D. EVERETT WAID, ARCHITECT

VIEW OF REFECTORY FROM WARD BUILDINGS

INTERIOR VIEW OF REFECTORY

SANATORIUM FOR THE METROPOLITAN LIFE INSURANCE CO., MOUNT McGREGOR, N. Y.

D. EVERETT WAID, ARCHITECT

VIEW OF REFECTORY FROM REAR OF ADMINISTRATION BUILDING

ENTRANCE FRONT OF SUPERINTENDENT'S HOUSE

SANATORIUM FOR THE METROPOLITAN LIFE INSURANCE CO., MOUNT McGREGOR, N. Y.

D. EVERETT WAID, ARCHITECT

GENERAL VIEW OF REST HOUSE

FIRST FLOOR PLAN OF REST HOUSE

RECREATION BUILDING FROM MAIN APPROACH

SANATORIUM FOR THE METROPOLITAN LIFE INSURANCE CO., MOUNT McGREGOR, N. Y.

D. EVERETT WAID, ARCHITECT

VIEW OF WARD BUILDING IN UPPER GROUP

VIEW OF WARD BUILDING IN INTERMEDIATE GROUP

SANATORIUM FOR THE METROPOLITAN LIFE INSURANCE CO., MOUNT McGREGOR, N. Y.

D. EVERETT WAID, ARCHITECT

WARD BUILDING IN INTERMEDIATE GROUP FROM MAIN APPROACH

GROUND AND FIRST FLOOR PLANS OF ADMINISTRATION BUILDING

ADMINISTRATION BUILDING SHOWING SERVICE END OF REFECTORY AT RIGHT

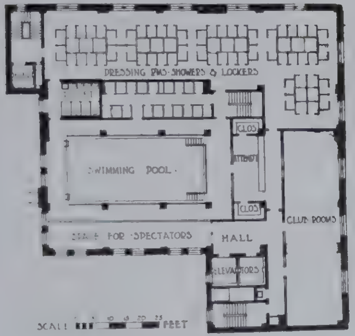
SANATORIUM FOR THE METROPOLITAN LIFE INSURANCE CO., MOUNT McGREGOR, N. Y.

D. EVERETT WAID, ARCHITECT

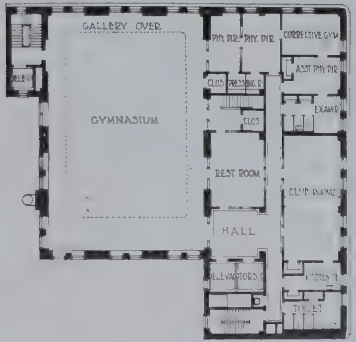
Y. W. C. A BUILDING, 53D STREET AND LEXINGTON AVENUE, NEW YORK, N. Y.
DONN BARBER, ARCHITECT

EIGHTH FLOOR PLAN

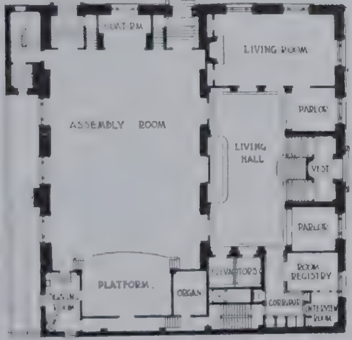
TENTH FLOOR PLAN



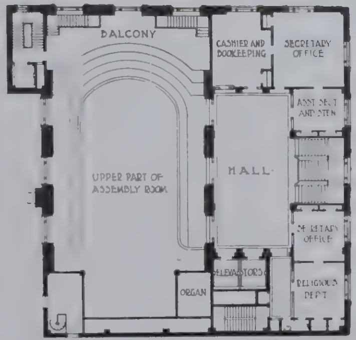
FOURTH FLOOR PLAN



FIFTH FLOOR PLAN



FIRST FLOOR PLAN



SECOND FLOOR PLAN

DETAIL OF MAIN ENTRANCE

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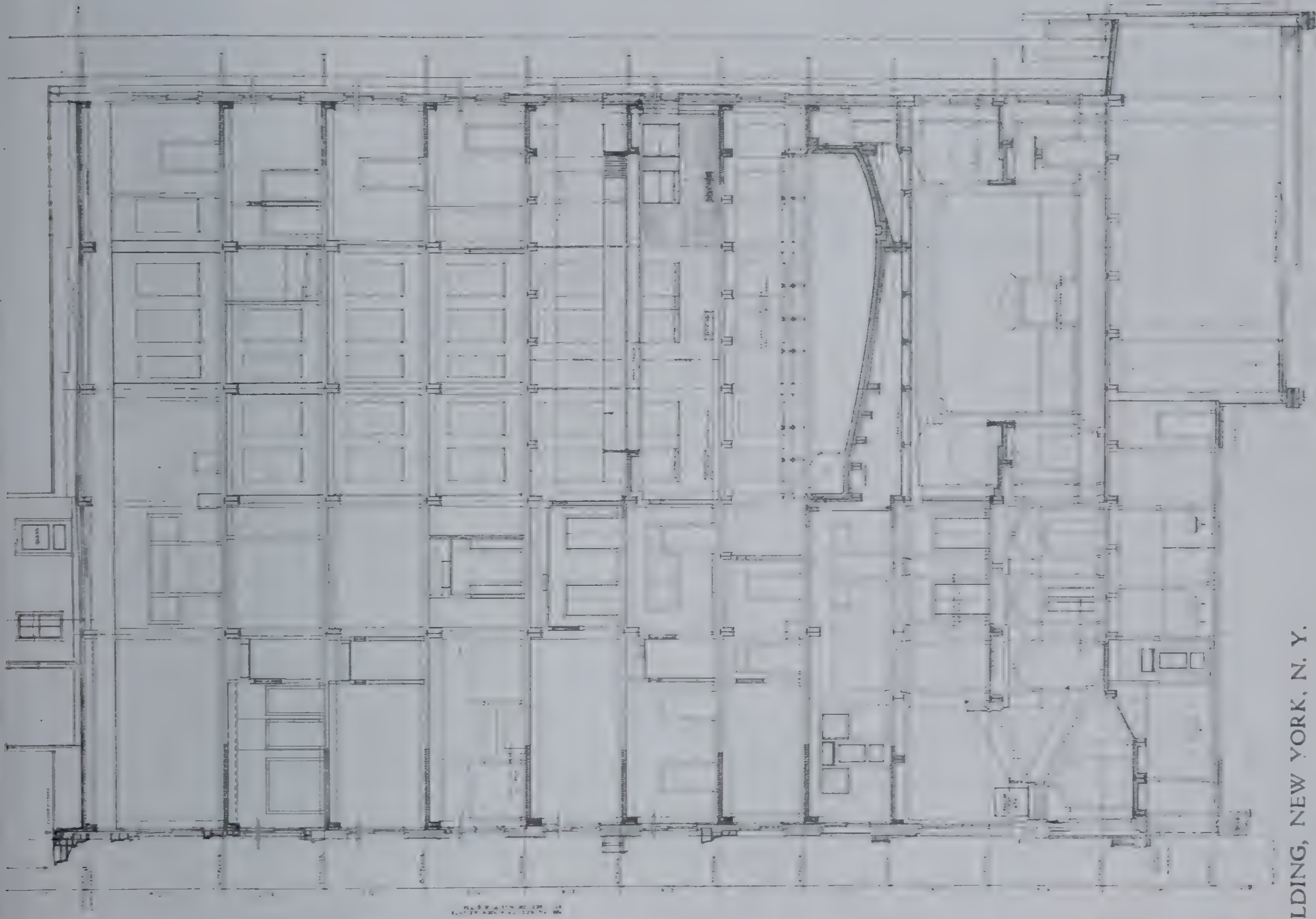
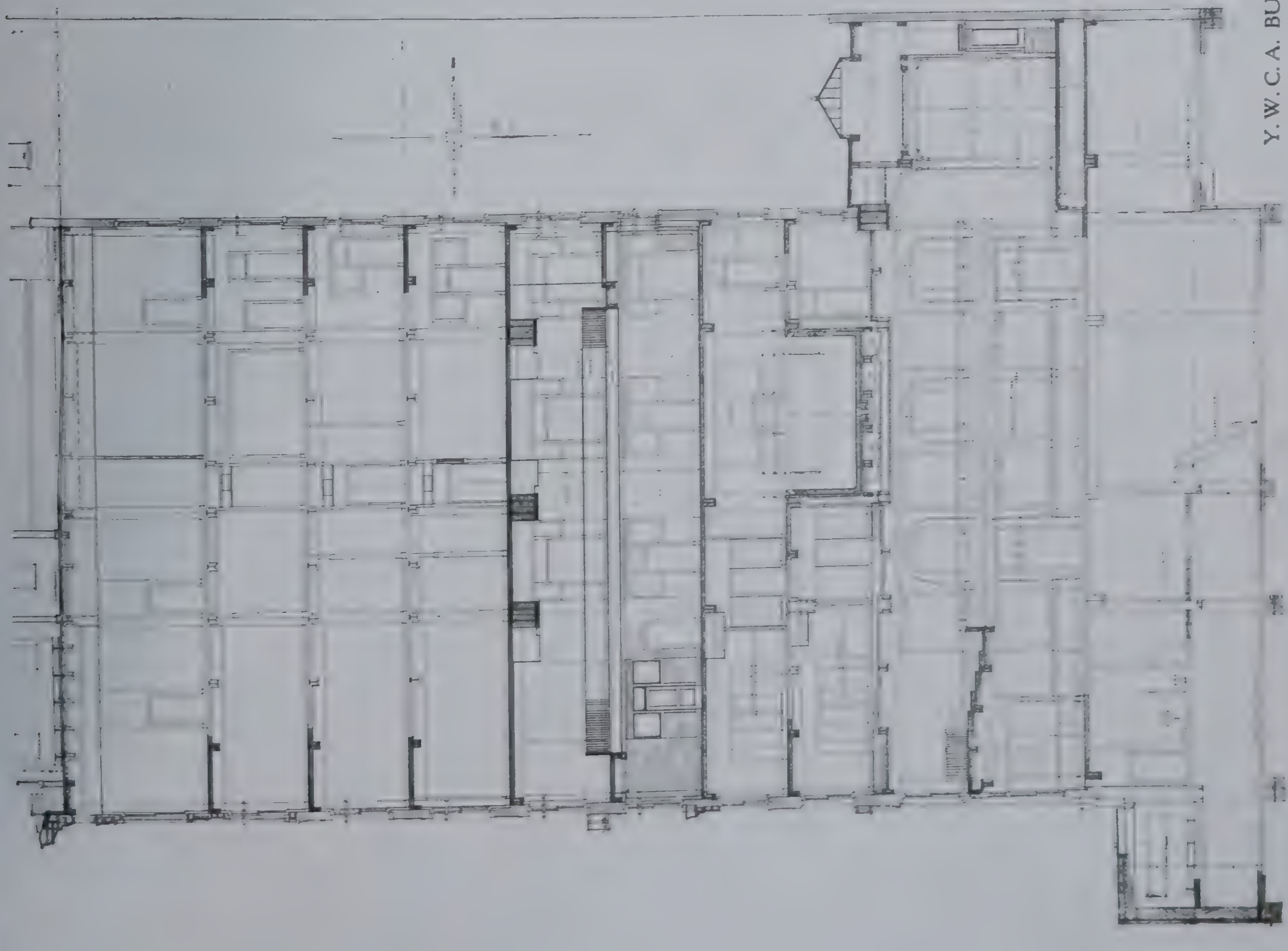
DONN BARBER, ARCHITECT



LONGITUDINAL SECTION



CROSS SECTION

Y. W. C. A. BUILDING, NEW YORK, N. Y.

DONN BARBER, ARCHITECT

LIVING ROOM ON FIRST FLOOR

DESK IN ENTRANCE HALL

DETAIL OF ASSEMBLY HALL

Y. W. C. A. BUILDING, 53D STREET AND LEXINGTON AVENUE, NEW YORK, N. Y.

DONN BARBER, ARCHITECT

DETAIL OF MAIN LOBBY

CAPITOL THEATER, NEW YORK, N. Y.

THOMAS W. LAMB, ARCHITECT

VIEW OF BOX FROM ACROSS PARQUET

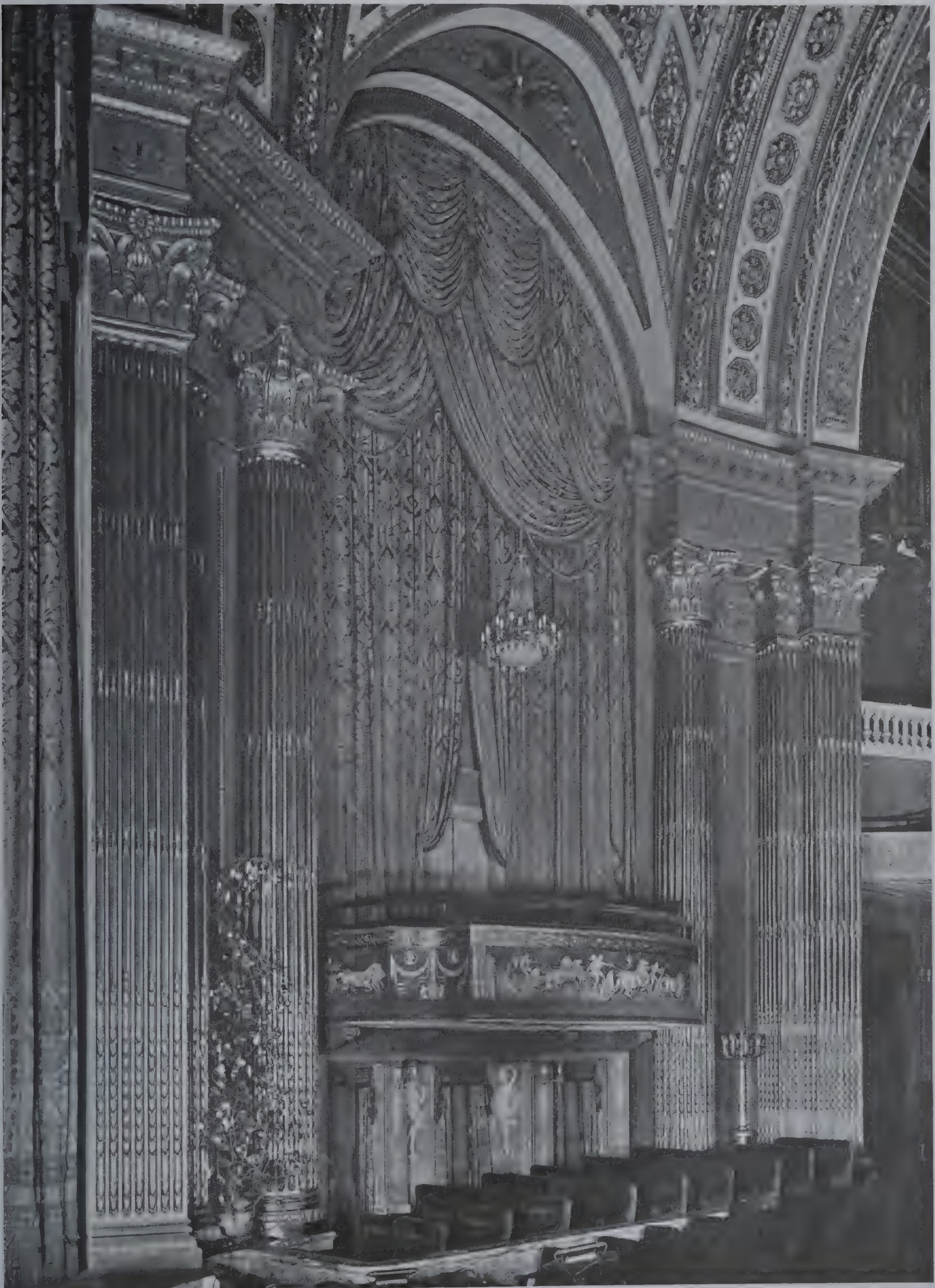
CAPITOL THEATER, NEW YORK, N Y

THOMAS W. LAMB, ARCHITECT

DETAIL OF PROSCENIUM OPENING

CAPITOL THEATER, NEW YORK, N. Y

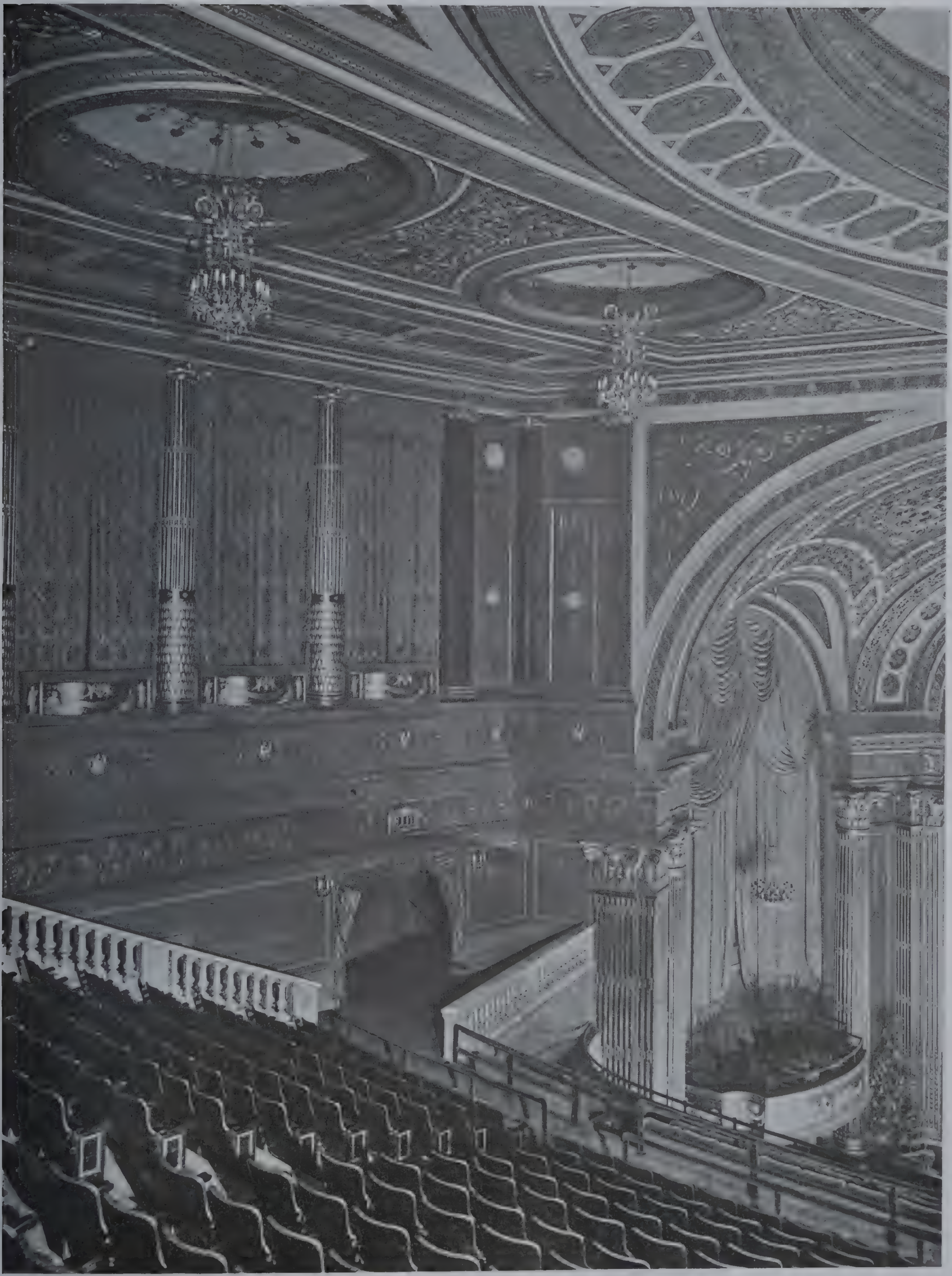
THOMAS W. LAMB, ARCHITECT



DETAIL OF BOX

CAPITOL THEATER, NEW YORK, N. Y

THOMAS W LAMB, ARCHITECT



DETAIL OF SIDE WALL AND CEILING

CAPITOL THEATER, NEW YORK, N. Y

THOMAS W. LAMB, ARCHITECT

END OF PROMENADE ON MEZZANINE FLOOR

CAPITOL THEATER, NEW YORK, N Y

THOMAS W. LAMB, ARCHITECT

The Capitol Theater, New York, N. Y.

By EMIL M. MLINAR

Of the Office of Thomas W. Lamb, Architect

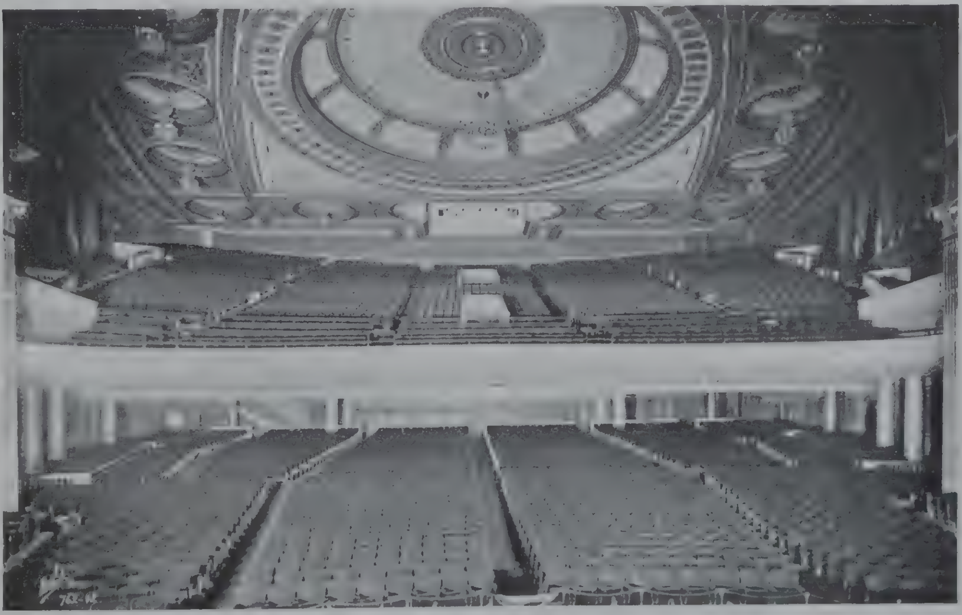
THE Capitol Theater is the newest notable addition to New York's extensive range of theaters and is remarkable in many respects. It commands attention first because of its great size; it is the largest theater in New York and probably, as its owners claim, the largest in the world. This is readily shown by its seating capacity which is 5,230, over 600 more than the Hippodrome, seating 4,623, and until now the most imposing theater of New York. Perhaps more astonishing is that this immense auditorium is devoted in the main to the display of motion pictures, disputing for all time the theory held by many a few years ago that the motion picture would never achieve such popularity as to rival the spoken drama.

The building is interesting from an architectural standpoint because of the unusual and difficult type of construction employed, and the manner in which so colossal an interior has been decorated to achieve the intimate effect essential to a successful theater.

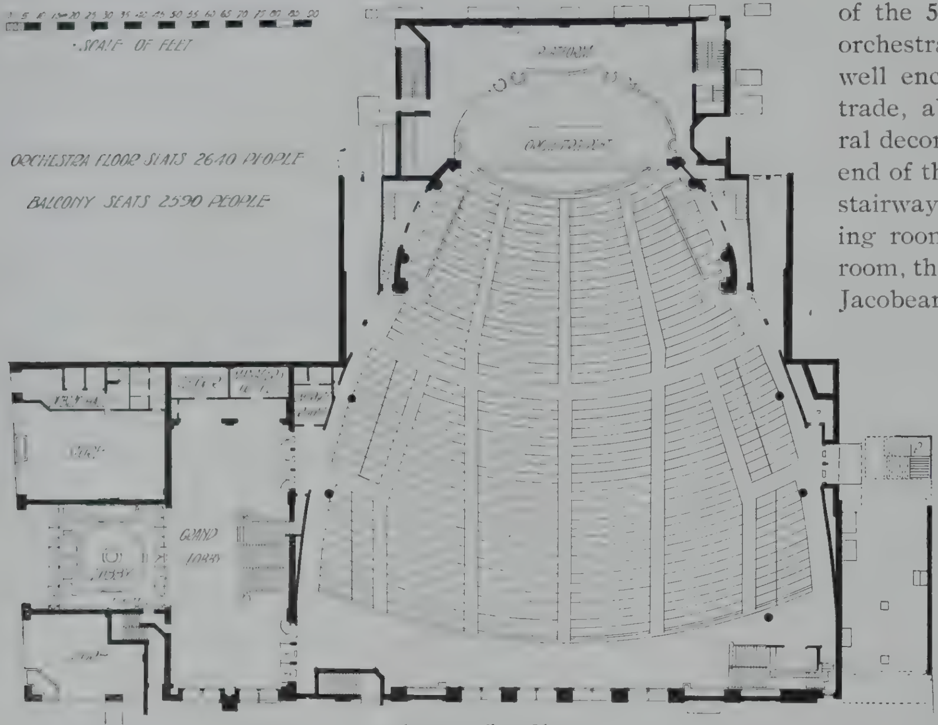
The building is located on upper Broadway on a plot formerly occupied by buildings of the old type that furnished a rendezvous for scenic artists, writers and other professionals in search of atmosphere. The area occupied by the building is in the shape of an inverted L, the Broadway frontage of 100 feet 6¼ inches being one extremity, the 51st street side with a frontage of 268 feet 11 inches the adjacent side, and the depth from 51st to 50th streets of 200 feet 10 inches comprising the other side, the frontage on 50th street running forward toward Broadway for a distance of 137 feet. It is in this large rear portion of the plot that the theater proper is located, with the stage on the 50th street side. The portion fronting on Broadway is used for the principal entrance and monumental lobby, with the upper floors given over to offices. The exterior of the structure is treated in the usual manner as an office building masking the auditorium, depending solely on the exterior opening to the lobby to indicate the purpose of the building. The classic motif of the Broadway façade is continued along 51st street to form the rear wall of the auditorium.

The big problem in designing the theater was encountered in the auditorium. This is of a scale found in but very few interiors; its size may be realized in that the orchestra floor seats 2,640 people — a full capacity for the average large theater — and that the single balcony seats 2,590 additional people. The choice of a style for the decoration was most important, and in selecting that of the Empire period, the dominating consideration was the desire to have dignity and to depart from the academic coldness which prevails in many periods, particularly as the design must enfold an expanse of interior, yet at the same time must counteract the depressing effect that is bound to result from area.

The entrance lobby, with marble walls, is treated in soft colors, almost pastels, *cafe au lait* shades predominating, and gold covering the stucco or plaster ornamentation. This gold is glazed with soft green to produce an Etruscan effect. Elsewhere it is a Roman gold with relief ornamentation glazed and rubbed into a cameo effect. This



View of Interior from Stage Showing Great Size of Auditorium



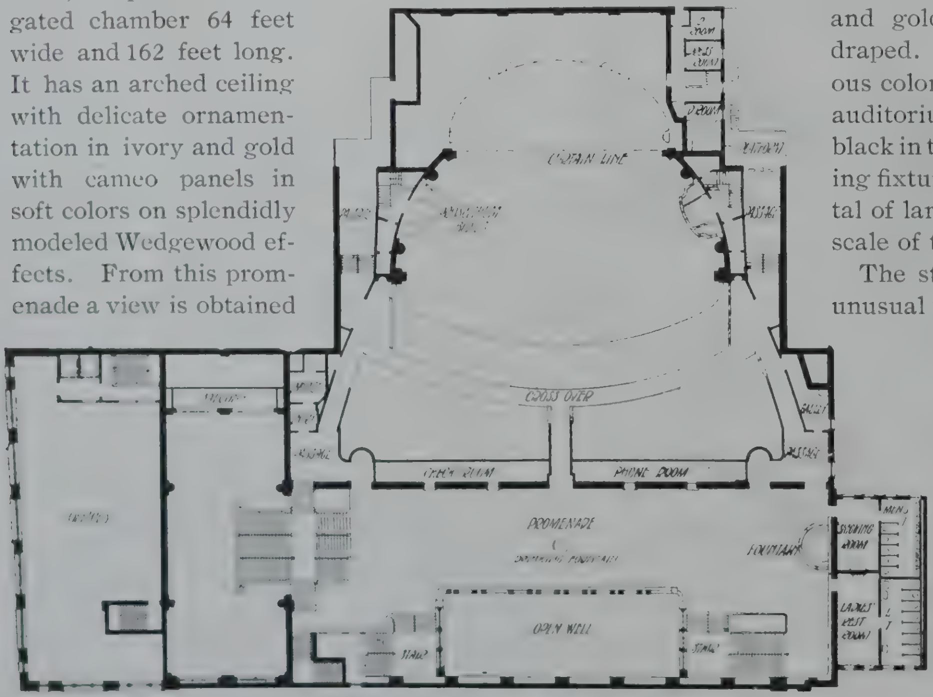
Auditorium Floor Plan

lobby leads to the main foyer, which spreads out luxuriantly to right and left, and gives access to a wide Italian marble staircase on the main axis. The walls of dark walnut rise to a beautiful ceiling of rich ornamentation in Roman gold with *cafe au lait* tints. Five great panels enclose murals of unusual interest and beauty, the work of an American artist, William Cotton.

The great staircase leads to the grand promenade, a spacious, elongated chamber 64 feet wide and 162 feet long. It has an arched ceiling with delicate ornamentation in ivory and gold with cameo panels in soft colors on splendidly modeled Wedgewood effects. From this promenade a view is obtained of the 51st street entrance to the orchestra floor, through an open well encircled by a marble balustrade, above which is a large mural decoration 72 feet long. At the end of the promenade opposite the stairway are located the men's smoking room and the ladies' retiring room, the former carried out in the Jacobean period, and the latter a charming example of Louis XV design. Entrance to the lower part of the balcony is had through openings along the left wall of this gallery.

The auditorium is decorated in a color scheme of *cafe au lait* with Roman gold ornamentation. The side walls are treated most successfully with a highly decorative Ionic order contrasting with richly colored hangings. The ceiling is composed of a large central dome, 64 feet in diameter, containing figured panels in soft colors, and surrounding it are ten smaller domes from which various lighting effects are obtained. A richly decorated sounding board is supported over the proscenium by a grand order framing the state boxes, which are reached from the orchestra floor. The hangings consist of peacock blue silk damask with putty and gold figures, most carefully draped. The carpets are of various colors, — black and gold in the auditorium, and old rose, gold and black in the promenade. The lighting fixtures throughout are of crystal of large size, to accord with the scale of the interior.

The structural steel design is of unusual type because of the great balcony. The absence of visible supports on the main floor for this large overhang is due to the use of a system of cantilevers projecting from the main balcony truss in a direct line 28 feet and diagonally 40 feet. These trusses are designed to reduce vibration to the minimum. They have been em-



Mezzanine Floor Plan

Exterior View Showing Broadway and 51st Street Facades

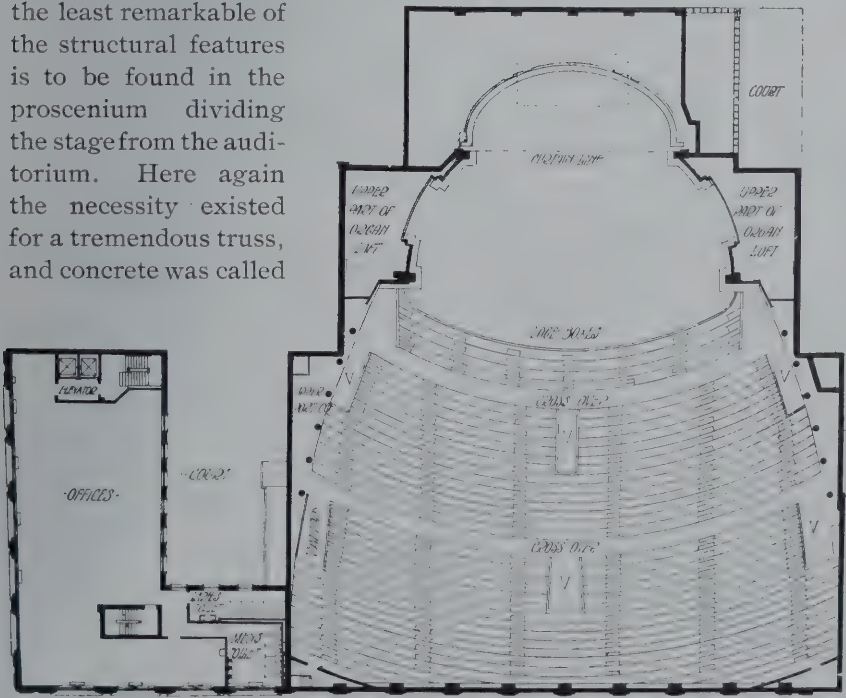
ployed in a few earlier buildings, but never before on so large a scale; this overhang extends 40 feet at the minimum — the center line of the balcony.

The main balcony truss is 160 feet in length, 16 feet 6 inches high, and weighs more than 100 tons. It extends from east to west on the 51st street side of the building, acting as the principal support for the series of cantilevers on which the balcony rests. It is supported at either end by a huge column 6 feet within the building, leaving an unbroken and unsupported span of nearly 160 feet. This tremendous sweep is one of the factors that contributes largely towards the atmosphere of airiness and lightness characteristic of this colossal theater.

There are other trusses within the building which are worthy of notice, especially in view of war-time conditions under which they were built. A system of eleven trusses, each with a span of 120 feet, supports the roof. These are 21 feet high at one end and taper to 14 feet at the main roof truss. The latter is 30 feet 7 inches in depth and has a span of 100 feet.

Some conception of the magnitude of the structural problems that had to be met is possible through understanding that 1,100 tons of steel were employed. Not the least remarkable of the structural features is to be found in the proscenium dividing the stage from the auditorium. Here again the necessity existed for a tremendous truss, and concrete was called into requisition to minimize the demand for steel. The proscenium opening itself is 61 feet wide and 50 feet high, and the truss in question spans this vast opening. A supporting pier at each side is made of reinforced concrete, 3 feet thick, 6 feet wide, and towering 76 feet high. At a point 50 feet above the stage floor the truss was poured in the same dimensions, closing the proscenium opening at the top and providing a solid truss 72½ feet wide, 26 feet high, and 3 feet thick.

The organ chambers are situated over the boxes just in front of the proscenium arch on either side of the theater, and the two divisions will be separated about 100 feet. This arrangement makes possible beautiful, antiphonal effects seldom heard in theaters. The thought uppermost was that the organ should bear the same relation to the theater that exists between a large cathedral and its organ. Although more than ordinarily rich in fundamental tone, it contains many stops of a novel character, and nothing has been omitted that would be useful in playing pictures.



Balcony Floor Plan

View of Proscenium and Sounding Board

View Showing Exits to 51st Street from Auditorium

CAPITOL THEATER, 51ST STREET AND BROADWAY, NEW YORK, N. Y.
Thomas W. Lamb, Architect

Young Women's Christian Association Building, New York, N. Y.

DONN BARBER, ARCHITECT

THE Central Branch Building of the Young Women's Christian Association of the City of New York is situated at the southwest corner of Lexington avenue and Fifty-third street. The size of the lot on which the building stands is 100 by 103 feet, and the structure is ten stories high above the street level, with basement and sub-basement below the street. This building, together with the National Board Building of the Y. W. C. A. erected in 1912, occupies the entire block front on Lexington avenue between Fifty-second and Fifty-third streets.

The National Board Building is twelve stories high and its façades are entirely of limestone in Renaissance style, inspired in its forms and details from the Italian. It is, generally speaking, an administration building.

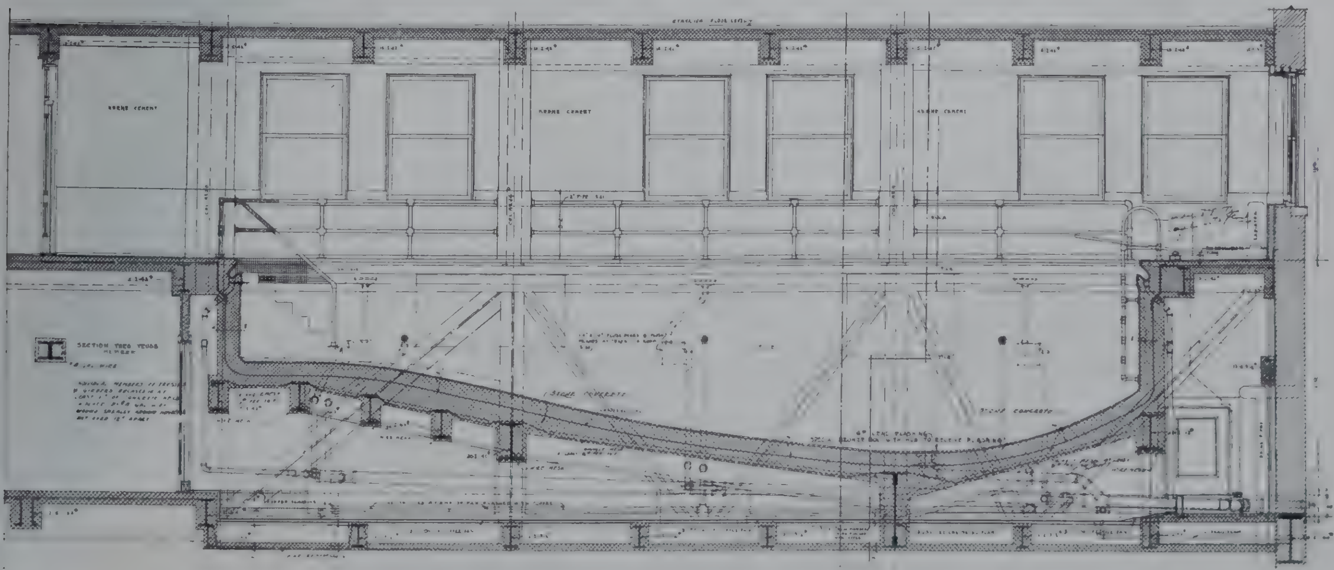
The National Board and the Central Branch, though both association buildings, are, however, entirely dissimilar both in their functioning and in their general style. They are two distinct types with nothing as to arrangement or use in common, though they are practically of equal volume and importance. It was the wish of the Y. W. C. A. Council that these two buildings should in no way resemble each other; that they should represent in their façades different entities and indicate as far as possible that their functions, and relation to association work are distinctly different.

Donn Barber, who designed the National Board Building, was chosen to be the architect for the newer Central Branch structure, and in carrying out the wishes of the committee he has produced façades for the Central Branch Building of brick, limestone and terra cotta, which are treated again in a free Renaissance style and conform to and are in harmony with the National Board Building, though frankly differing from it.

The monumental character and materials permissible and desirable in the National Board Building are in no way reflected in the newer structure, though the base and certain cornice and band courses have been carried through. The Central Branch, which is the largest women's club building in the city, has been designed and built in such a way as to furnish a model of simplicity and directness, arrangement and equipment, and is of strictly economical cost of construction. The building in composition and treatment, inside and out, is of an up-to-date, institutional type and is handled with unusual and admirable restraint and sense of practical fitness. Many special features of interdependence and logical relation hitherto untried or achieved in buildings of this type have been studied and ingeniously worked into the general scheme, greatly to its benefit, and in their successful solution these should serve as precedents in the development of future buildings.

In studying the plan arrangement, careful consideration was given to the possibility of future extension of the building to the west, or adjoining the assembly and gymnasium side of the building.

The disposition of space in the building is shown in the reproduction of the floor plans on Plate 8, but a few notes may explain them more fully. The principal feature of the first floor is the large main assembly room, which is 80 feet long by 50 feet wide and 30 feet high. It runs up through



Detailed Section Through Swimming Pool on Fourth Floor

two floors and has generous direct exits to Fifty-third street. On the Lexington avenue side of the second floor are located the executive offices, connected by a central reading and lounging room, which in turn connects with the gallery level of the assembly room. The third floor contains a series of club rooms on the Lexington avenue side of the building capable of being opened into one another, and completely separated from these on the Fifty-third street side is the lower tier of dressing, locker and shower rooms, which extend up through two stories. On the fourth floor over a portion of the assembly room is the swimming pool with its visitors' gallery, having direct access from the main hallway. On the fifth floor is located the gymnasium, a room equal in size to the assembly room and again over it. The gymnasium runs up through two stories and is amply provided with light and air from three sides — an admirable and unusual feature in buildings of this kind. The sixth floor gives access to the visitors' gallery of the gymnasium and contains the board of directors' room, social and work room, and the department for trained attendants with its dressing and work room and diet kitchen. The seventh floor contains the library and its dependencies, employment department with waiting room and interview rooms, offices and class rooms. The eighth floor is given over in its entirety to a series of class rooms for typewriting, stenography, bookkeeping, etc. The ninth floor is used again for class rooms and work rooms for teaching trades and a model flat for household arts. The tenth floor contains a large cafeteria, a cooking school and its various dependent services, and rest room.

The building considered as a whole is, generally speaking, divided into three quite separate sections, or departments, the lower portion of the building being given over to social work, the central portion to physical development, and the upper portion to educational interests. These three services are distinct in themselves, but their proper interdependence and their practical intercommunication has not been lost sight of. Many hitherto unsolved, detailed problems of a technical nature have been arranged for in this building, and in its operation they have proven to be eminently practical and satisfactory in many new ways for the handling of Association work. In its design, furnishings and fittings, the building is unusually plain and free from any elaboration. Circulation problems are simple and meet the building laws governing such questions, directly and adequately.

Perhaps the one outstanding novel feature of the building is the position and arrangement of the gymnasium department and its direct private communication to the dressing rooms, locker rooms and the swimming pool. Ordinarily in such buildings the pool is placed in the basement and lighted only, or principally, by artificial light, and ventilated by forced means. Here the necessity for heavy steel at the third floor level to span the assembly room has suggested and brought about an arrangement of high trusses into and between two of which has been harnessed the pool construction. These trusses carry the assembly room ceiling, the pool and the floor of the gymnasium. The heavy columns which support these trusses carry on up through the gymnasium and in turn carry lesser trusses spanning the gymnasium, and these final trusses carry the columns for the upper five stories of the building. By this arrangement the heavy loads and spans are all taken care of in one section of the building, leaving the remaining framing quite simple and normal.

As rock was found at about what has been taken for the basement level on the site, a considerable rock excavation at high cost would have been necessary if the pool and its dependencies had been placed, as is usual, below grade. It was decided to save the cost of rock excavation and to apply some of the saving on extra steel. The final cost of the building shows that this scheme has produced not only a substantial financial economy, but it has made practical the placing of the athletic and physical department well up in the building where it is possible to get abundant air and light.

Another most successful feature is the detailed arrangement of the showers, dressing rooms and locker spaces that make their use adaptable for widely varying numbers in attendance, with no crowding or confusion resulting from their use by the larger numbers.

Fully detailed reports of the activities housed and their practical handling in this building would tell the real story of this building and its adaptability from the Association point of view, in daily use, and, if space permitted of such data being presented here, it would be most interesting.

Finally, the building contains its own heating, power and lighting plant of such generous size that it not only supplies its own requirements, but furnishes heat and light to the twelve-story National Board Building next door.

The original contract for the building was let at a cubic foot rate of about 27 cents. The power plant, including generators and motors, was an after consideration and brought the cost of the finished building up to about 30½ cents; adjustments made to the contractor on account of the increased cost of labor and materials due to war conditions brought the total cost of the building up to about 32 cents per cubic foot, exclusive of furniture and equipment.

Interior Decoration

THE PERIOD OF LOUIS XIV

By MATLACK PRICE

THE decorative side of architecture is yearly becoming a matter of increasing interest and study to the architect who, in many cases, has added to his ancient office of master builder that of interior decorator.

Because of this, and because the greater part of the architecture of this country finds its derivation from historic European styles, it is increasingly necessary that an extensive study be made of period design and of the decorative accessories associated with the periods.

It is no longer enough to possess a reasonable familiarity with the style of Renaissance Italy, of the periods of the French Louis XV and XVI, and with the principal English periods of decoration.

The practice of period decoration has progressed so far that it is now important, and even essential, to be familiar with the various minor phases and sub-styles of the periods, as well as with certain entire periods which, for one reason and another, have not figured very extensively in modern adaptation in this country. Among these might be enumerated the art, architecture and furniture of Renaissance Spain, the Baroque style in its several forms, the styles of Francis I, Louis XIV and the Empire and Directoire in France. There are also a few discoveries to be made in England and in this country.

It is the purpose of the present article to bring out a few points on one of the least understood of the French styles — that of Louis XIV, a style largely misunderstood and seldom adequately appreciated. This style is usually regarded as unsuited to present architectural uses largely because of the ornate and heavy character of most of the furniture of the period; but when studied from an architectural angle, certain qualities of merit are perceived which are not at first apparent.

The usual approach is backward, with the style first seen from a position of comparative familiarity with the styles of Louis XV and Louis XVI; whereas a real understanding can only be reached by working toward the style of Louis XIV from

Dining Room in the New York City Residence of the Late John Jacob Astor
The Furniture is Distinctly in the Style of Louis XIV, in Modern Adaptation, as Well as the Ceiling and the Entire Effect of the Room
Richard Morris Hunt, Architect

the beginning of the French Renaissance, in the early sixteenth century.

Thus, under Louis XII, French architecture, both exterior and interior, is seen to be essentially Gothic, with beginnings of Italian forms — forms more characteristic of the Italian Renaissance than of Classic precedent. As in the Ducal Castle at Nancy (1501–1512) it was common to see pilasters decorated with Italian Renaissance arabesques and terminating in Gothic pinnacles. Parts of Blois were built at this time, and the great château was extensively altered and enlarged under Francis I, the famous stairway being added at that time. It was the period of great châteaux, like Chambord, retaining a good deal of medieval character, but tending ever toward the urbanity and modernity of the later châteaux of France.

Doorway, Salle des Gardes de la Reine, Palace of Versailles

There was still much distinctly Gothic architecture in the buildings of this period — they were, in fact, Gothic buildings embellished with Renaissance details, the balance constantly tending to grow greater on the Renaissance than on the Gothic.

The style known as Henry II (1530–1590) began to show departures from that of Francis I three years before the accession of Henry to the throne, for Francis died in 1547. The Henry II period in architecture and decoration carried through the reigns of Henry II, Francis II, Charles II and Henry III, and grew ever more and more toward a complete expression of Renaissance ideas. It was not at all unnatural that this should have been the case, for Francis I had introduced many Italian artists and artisans into France, and the influence of these was strongly augmented by the Renaissance enthusiasm of the numerous French architectural students who had gone to Italy to learn what they could of the far famed genius of Italy's great humanistic revival. There was, furthermore, the powerful court influence exerted by the queen, Catherine de' Medici, who was married to Henry II in 1533 and, until her death in 1589, showed a continuous interest in architecture and the fine arts, and naturally in Italian styles and workmanship.

The displacement of Gothic forms by Renaissance classic forms, which had been gradual but continuous since the time of Louis XII at the beginning of the century, thus gained a new impetus, and by the close of the reign of Henry II scarcely a trace of Gothic feeling remained. The architectural stage was being cleared for another battle of styles, which was to commence in the reign of Henry IV and culminate in the reign of Louis XIV.

Meanwhile, buildings of essentially Italian character were the rule; as, for example, the Hotel d'Assezat, in Toulouse, the gatehouse of the Château of La Tour d'Aigues, and the court of the Château of Bourmazel. Philibert de l'Orme was one of the greatest architects of the period, and the Château of Chenonceaux, as enlarged by him, one of his greatest works. At Fontainebleau, too, De l'Orme did extensive work, and his influence was widely felt by other architects of the period. Two other great names of the period were Jacques

Chamber of Louis XIV, Palace of Versailles

du Cerceau and Jean Bullant, the former a facile designer of furniture and mantels. Primaticcio, the Italian, always in favor with the De' Medici Italian Queen Catherine, was given complete control of all court architectural projects, as well as of all allied arts and industries.

Following the now distinctly classic style of Henry II came that of Henry IV, which continued through the reign of Louis XIII and culminated in the style of Louis XIV.

With no trace of the Gothic style now remaining, a new competitor against the classic spirit appeared in the form of the Baroque, which, in Italy, was symptomatic of the overripening of the Renaissance. Under Louis XIII architecture and decoration became noticeably Baroque in character, and the classic ideal, still struggling against Baroque through the period of Louis XIV, became submerged in the Louis XV wave of Rococo, to emerge, at last triumphant, in the superb and gracious style of Louis XVI. The style of Louis XIV is given as extending from 1643 to 1715, while the monarch's long and glorious reign comprised the years between 1640 and 1710. In England these years were occupied by six reigns: the two Charles, the Commonwealth, the second James, William and Mary and Queen Anne.

Pair of Doors in a Modern Version of that Type of Italian Baroque which was One of the Most Conspicuous Component Parts of the Style of Louis XIV
Howells & Stokes, Architects

Architecture and decoration under Louis XIV are broadly divided into two sub-styles: the first being a compromise between Palladianism (the name accorded to the Italian-classic style) and the Baroque; the second, that gorgeous and dramatic style characterized by "the Grand Manner."

It was a period of direct patronage and control of art by the Crown; it was "le Grand Siècle," when France reached her maximum of national unity, power, prosperity and magnificence. It was a period of brilliant life at the court, of brilliant achievements in architecture, art and literature. The three sub-periods of the reign divide its architecture as well as its general life. First, the forces of the nation prepared for the succeeding era of greatness, systematically gathering under the sole direction of the Crown all the national activities and resources. Following this was the period of culmination, which lasted until 1680, and which saw the armies under Louvois winning for France a dominating place among the nations, while Colbert was effecting the same result through the systematizing of politics, administration, literature and art. The inevitable decline, which de-

Examples of Modern Damask Inspired from Louis XIV Originals

veloped gradually from 1680 to 1690, followed the death of Colbert in 1683. The highly efficient organization of the government at last brought the reaction of a general wish for less dictation and less control. It was Louis XIV who said, with entire truth, "*L'etat, c'est moi*"; but the State, in time, found such an identity to be highly uncongenial, and the official control of the nation's activities grew constantly less.

During the first part of the period all design showed far greater unity and concentration than in any part of the preceding period, with the classic spirit, or "Palladianism," generally in the ascendant. All the arts related to architecture, as well as architecture itself, received the same impetus of lavish patronage by wealth and power that brought the culmination of the Italian Renaissance, and during the height of "le Grand Siècle" of "le Grand Monarque," Louis XIV, the energies of architects, cabinet makers, decorators and textile industries were dedicated to the creation of magnificent palaces, chateaux and public monuments, with Versailles the center of interest. The close of the period saw a strong tendency on the part of the artists and the art schools to free themselves from the restraints of official dictate and the State's prescribed uniformity of artistic production.

The intention of the State in assuming control of the art and architecture of the country was not only to make complete its dominance of national activities, and secure for its own uses the greatest contemporary talent, but also to achieve works which would reflect credit and glory upon the King and his Court. The Colonnade of the Louvre, the Dome of the Invalides, the Gate of St. Denis and the Palace and gardens of Versailles are typical of the results of this policy.

Colbert was appointed as the Court Architect and director of all kinds of artistic production, and his duties comprised "reviving or founding royal manufactures, housing and protecting native artists or sending them to study abroad, importing artists and models for imitation, painstaking industry in the conduct of the royal building operations, and the decoration and furnishing of palaces and public edifices."

France, instead of Italy, soon became the originator and arbiter of decorative style. While the style of Louis XIV, in monumental work, was inclined to be classic (in certain forms rather than in true architectural purity), the style in decoration showed more of a conflict between Italian Renaissance "Palladianism" and Italian Baroque.

Being based, however, on the rationalistic ideals

Dining Room in an American Country House Showing Direct Application of Louis XIV Forms in the Furniture

Armchair of Louis XIV Period Showing Italian Influence

of Henry IV, the style of Louis XIV was a highly "finished" style, rich and perfect in detail, and plainly showing a big sense of architectural design in large projects. It was a thoroughly French version of Italian classicism.

The decorative fabrics of the period — tapestries, damasks, brocades and velvets — were rich and elaborate and as thoroughly in "the Grand Manner" as the painting and architecture of Louis XIV.

The furniture, as seen in a few typical examples from the Metropolitan Museum in New York, was thoroughly characteristic of the prevailing ideals of magnificence. The square and decidedly "architectural" legs of this table were one of the distinguishing features of the furniture of the period, and are seen again in modern reproduction in the tapestried dining room shown in one of the illustrations.

One of the two armchairs from the Metropolitan Museum, shows distinct elements forecasting the style of Louis XV, while the carved corbel is distinctly Renaissance in character.

It was under Louis XIV that Boule * created his famous cabinets and tables with rich and superbly carved ormolu mounts, and Jean and Daniel Marot designed great decorative tables and other pieces of furniture.

The furnishing of the luxurious châteaux of the period called for a great variety of rich decorative accessories besides furniture and fabrics. There were massive and elaborate clocks, bronzes, chandeliers, sconces, screens and mirrors. The marble tops of consoles and tables held great porcelain vases of superb fineness.

Frequently among the decorative objects which were so profusely designed and manufactured in the great period of Louis XIV are seen pieces which clearly forecast the coming style of Louis XV — pieces which indicate an imminent reaction from the grandeur and formality of "le Grand Siècle" to a spirit of abandon and frivolity.

Before developing some thoughts upon the message of the architecture and decoration of the period of Louis XIV to the architecture and decoration of to-day, a word remains to be said on the subject of decorative textiles.

Fabrics began to take on rich and grandiose character under Louis XIII, reaching the height of sumptuous splendor under Louis XIV. Patterns for the most part were inspired by the decorative art of Renaissance Italy, but gradually developed in the direction of motives of a more national and contemporary sort. The design of gardens about the great châteaux had come to be such a distinctive achievement of the period that many suggestions of trees in full leaf, arbors, baskets of flowers, and even vistas of formal gardens, began to appear in decorative textile designs.

Armchair of Louis XIV Period

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* Also spelled "Boulle" and "Buhl," and the work sometimes called "Buhl work."

Carved Wood Corbel of Louis XIV Period

But this style of Louis XIV, great, complex, splendid, monumental, is regarded as a thing which holds no meaning for us today, no inspiration, or suggestion.

Has it no meaning for our architects and decorators?

Architecturally, there was a bigness of concept which is rare to-day—an ability to think in vast but well ordered terms. Le Vau had this large vision, and Le Pautre and De l'Orme and Mansart.

The palace of Versailles, vast as it was when Le Vau's work upon it was complete, was more than doubled by Mansart. Much of the interior architecture was the work of Le Brun, including the grand staircase, rich in marbles, bronzes and mural paintings, and the Galerie des Glaces, so recently one of the settings for the great Peace conclave.

The interior decoration of the great buildings of Louis XIV was far more architecturally planned than is most similar work to-day. Ward, the great English authority on French Renaissance architecture, tells us that "the decoration of a room is a clearly thought out and carefully balanced scheme, distributed into large, well defined divisions, and these sometimes divided into smaller compartments." And "the subjects of the paintings and enrichments contribute to the symbolic meaning of the whole scheme as much as their form and color to its decorative effect. There is an intellectual quality, a spirit of order and organization in Louis XIV decoration, which is as characteristic as its pomp and sumptuosity."

Is any "intellectual quality" strikingly apparent in the greater number of our large buildings? Have we even, in any case, copied these great old masters with such conspicuous intelligence as to entitle us to criticize their works?

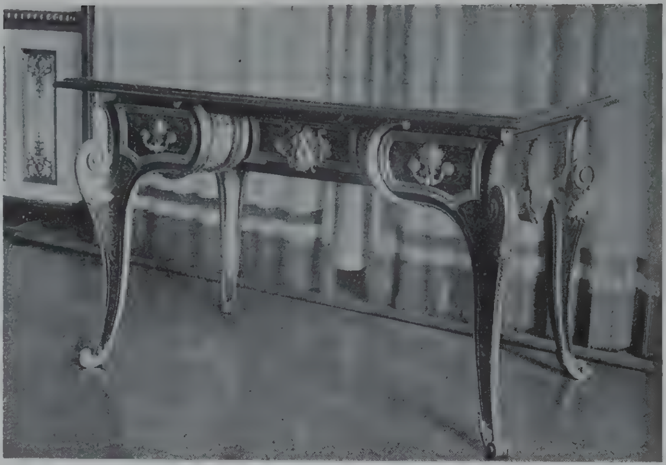
Have we to-day any practicing architectural scholars of the type of Julien Mauclerc, Du Cerceau, Bullant, the Marots or Blondel? The folios of these earnest architects, illustrated with the most exquisitely detailed engravings, held ever before the eyes of their colleagues and pupils the eternal verities of the classic principles of architecture as opposed to the strong counter-attraction of Baroque.

Times are different to-day, it is true, and no architect could find time to execute a hundred or so large copper-plate engravings embodying his convictions upon architecture. But is the *spirit* in existence to-day? The books of these old masters are used to-day for reference and for inspiration, even though we take the stand that their works hold no practical possibilities for contemporary architecture. Where is the thoroughness of these early architects?

And where, too, is their versatility and their fertile invention? Le Pautre and many others made a practice of showing *projets* for ceilings in which the drawing is divided into quarters, and in each is exquisitely drawn an "alternate" scheme each quite different from the others, and all four of such striking merit that it would be difficult to select the best one from among them.

Where is the patronage of art and architecture which accomplished such profuse and varied works? Is there any individual in this country to-day corresponding to Colbert, who sent students and draftsmen to Italy to learn Italian architecture and return with it to France? Not only did

Carved and Gilded Table of Late Louis XIV Period



Boule Table from Palace of Versailles

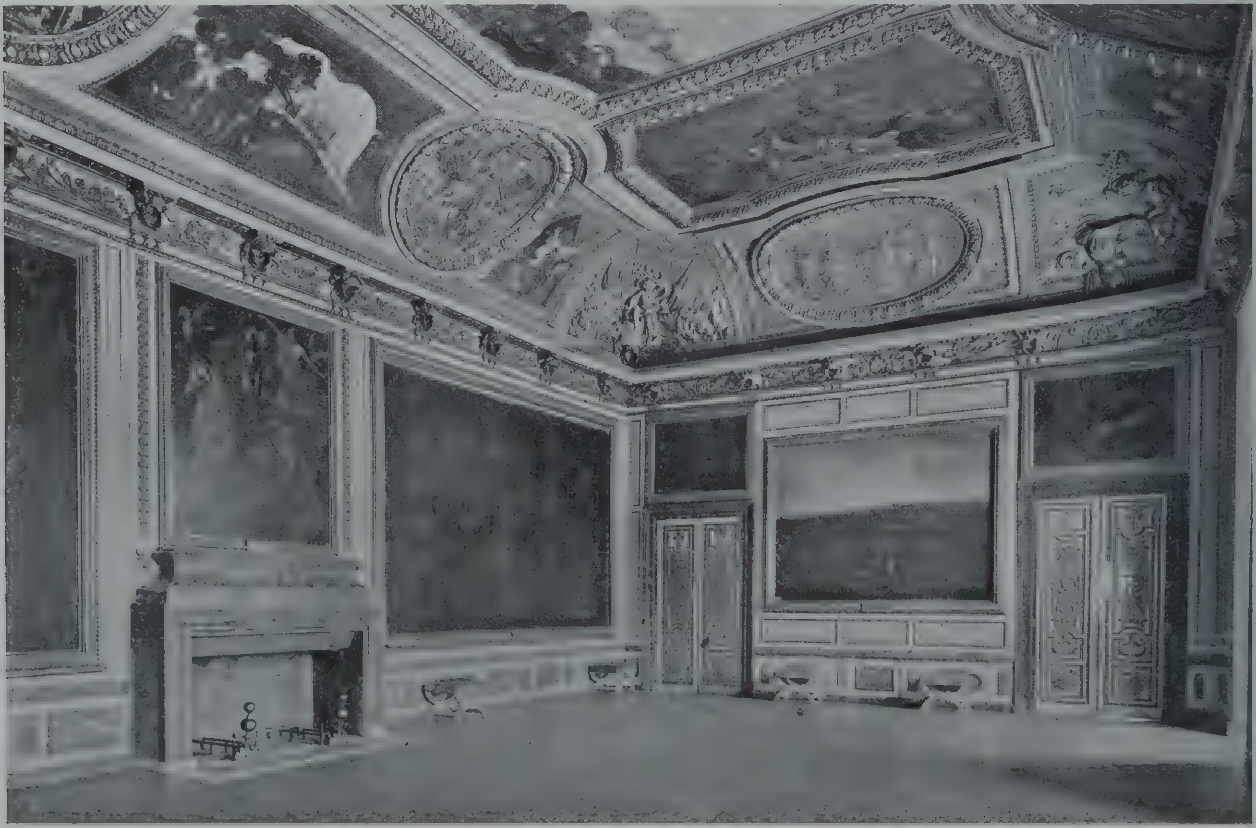
Colbert send students to Italy, but he saw to it that such students and draftsmen as remained in France had the benefit of such instruction as was available at the time, and were provided with living and working quarters. He also coordinated the manufactories and industries which produced decorative accessories, subsidizing them where necessary, and ever directing and encouraging the development and progress of national arts of every kind. Times have changed — yes — but let us not look with a too patronizing superiority upon the period of Louis XIV.

It is true that much work of the period would be unsuited to use in the domestic architecture of to-day, but there may be larger things which we can learn from the *spirit* of "le Grand Siècle."

The "palatial" residence of some years ago, with ostentatious opulence unknown to-day, called for furniture and decorations in the style of Louis XIV, and "the Grand Manner" was the ideal of the large hotel even as recently as the erection of the Hotel Manhattan, in New York City, where, in the 43rd street lobby, the style may be seen in all its glory.

The whole idea of the great hotel has changed to-day in a reaction which swung from the obvious opulence of Louis XIV to the more subtle "smartness" of the Brothers Adam, and large residences turned mainly to Italian, English and Georgian prototypes for their inspiration.

The most valuable thing which is to be learned from the style of Louis XIV for application to-day is to be found, as was intimated above, in some of its larger aspects. It was a supremely self-confident style — a style which thought and functioned in large terms. The artists, architects and decorators of the period were the master minds who did the preliminary work, which later developed into the supremely perfect style of Louis XVI, and for this reason, if for no other, the architect and decorator of to-day will find "le Grand Siècle" a study valuable, inspiring and entertaining.



Salon de Mars, Palace of Versailles

DEPARTMENT OF ENGINEERING & CONSTRUCTION

CHARLES A. WHITTEMORE, *Associate Editor*

Heating the Small Garage

By R. E. BARTON

IT IS a strange fact, but none the less true, that approximately 90 per cent of the building construction entered into during the year 1919 was either directly or indirectly connected with automobiles. Garages, industrial plants for automobile manufacture, plants for manufacturing parts of automobiles, sales rooms, office buildings, service stations and small garages help to make up this list. The problems involved in the larger structures have been quite thoroughly investigated, but the problems in connection with the small garage have been neglected to a degree almost indicative of a lack of interest. The tremendous growth of the automobile industry and the almost universal use both for business and pleasure purposes make the care and housing of the machines an important consideration.

The greater number of residences being built to-day have a garage as an accessory equal in importance to the sleeping porch. There are, however, many such which have no heating arrangements, and inasmuch as the "year around" use of the car is so much more common than in past years, some method of keeping the garage above the freezing point is a necessity.

Whatever the type selected may be, it should, if possible, be placed outside the car space and should be in a separate enclosure with an entrance independent of the main garage room.

Each individual owner may have some definite idea as to how he wishes to have his garage heated, but the ultimate result in every case is the same; that is, to keep the temperature of the garage at such a point that the cooling system of the car will not freeze and the lubrication will not congeal due to a low temperature.

Consideration should also be given to the fact that at many times the owner likes to "fuss" around the car. In this case the garage should be kept at a slightly higher temperature than would be necessary simply for protection against freezing.

There are three principal elements which enter into the selection of the heating units: first, economy of operation; second, economy of installation; and third, fire protection. These are not here placed in positions of relative importance, but in the order of usual consideration.

Without doubt the most inexpensive apparatus to install is the gas steam radiator, but there is a possible danger in connection with this method of heating because the flame, although usually enclosed, is almost on a level with the floor, and as the gas vapors are heavier than the air, they might come in contact with the flame and thereby cause combustion.

There are, however, several devices of this type now in the market which receive the approval of the National Board of Fire Underwriters, and which may be installed without occasioning any defect charge on the insurance rate.

A hot water heating apparatus is probably the most satisfactory method of heating the small garage. A separate heater placed in the basement of the house and pipes run underground to the garage will give satisfactory results if the garage floor is not too near the boiler level. These underground pipes should be well insulated and should run in a conduit or waterproof trench. They should be installed in such a manner as to permit renewal or repairs without the necessity of tearing up floors and lawns. This can be done readily if a little foresight is used.

The radiator should be placed directly in front of the car, for being so placed it will require fewer sections to keep the machine from freezing. Draw-off valves should be placed at low points so that the system may be emptied when heat is not required and all high points must be well vented.

If the garage floor is not much higher than the level of the house heater, it is better to run the supply pipe up to the second floor of the house and drop down to the basement as shown in Fig. 1 to the garage. This is sometimes referred to as a loop or a false water leg. The expansion tank must be placed above the highest point of the system, if an open tank is used.

If the garage radiation is supplied from the house boiler, a separate line should be taken directly from the heater. If the garage is much lower than the first floor of the house and the loop to the second floor is not possible, one or two of the return risers from the second floor of the house, as shown in Fig. 2, should be used for the supply to the garage radiators. The return from the garage should be brought back separately to the heater. An installation of this type will maintain an even temperature, but obviously will not

be so flexible or so positive as a separate supply direct to the garage. Perfect circulation in the house system must be maintained in order that the return may have high enough temperature to be efficient. It is also well to consider whether the garage might not require heat at times when the house might be unheated.

Either of the systems mentioned can be used in cases where the garage and house are being built at the same time; but when the house is already built and the heating apparatus installed, the safest method is to install a separate heater, unless the house heater may be easily increased in size. Generally speaking, to increase the size of the heater would be more expensive than to install the separate heater, and it would not be any more economical in operation. If the garage is more than 60 feet from the house, a separate heating room should be connected to the garage. The heating room floor can be on a level with the garage floor and thus simplify the construction.

FIGURE_1

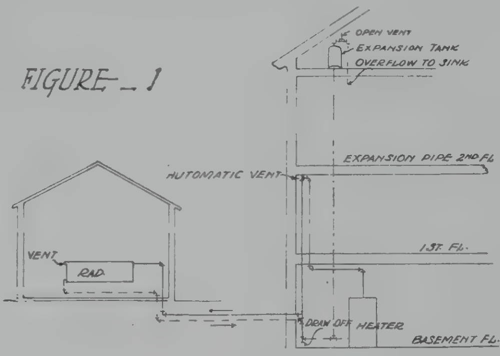
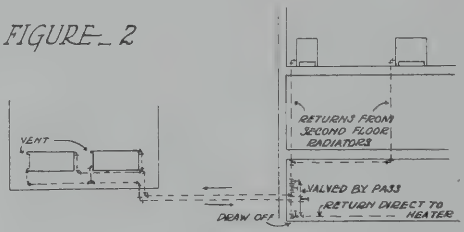


FIGURE_2



Steam heat as applied to the small garage is quite analogous to the hot water systems here described. Slight variations in equipment are necessary, but the average layman has a fairly comprehensive knowledge of these features. The one-pipe steam and the two-pipe gravity system are both applicable in many installations. There is, however, a point where hot water is superior to steam, and that is in maintaining a positive circulation with a low fire. Steam coils cool so rapidly with a "banked" fire that a sudden drop in temperature during the night may nullify the effectiveness of the installation. With steam a quicker heat may be maintained and with thermostatic control very satisfactory results may be obtained.

There is also the vapor system to consider. This method is efficient but more expensive to install than either the steam or hot water. It has advantages over either of the other systems which, in some cases, may outweigh the item of extra cost. Uniform heat more easily controlled than steam, quicker heating action than hot water, smaller variation range of temperature than either, are the advantages of a vapor system properly installed.

The study of garage heating develops many types of self-contained units which are adaptable to certain installations. In investigating these systems, fire protection, temperature control, fuel consumption, attendance — all must be taken into account. Electrical devices may be expensive to operate, and an interrupted current may cause considerable inconvenience and damage. It is also difficult to adapt electricity to general heating of the garage space, but for local heating such as the engine or water circulation it gives better results.

In heating public garages, a two-pipe gravity steam or vapor system is preferable. The most important item in laying out the heating apparatus for a large garage is to select the proper size boiler.

Most garage heating specifications call for a temperature of from 50 to 60 degrees. Radiation working in this temperature will condense from 50 to 75 per cent more steam than when working at 70 degrees. Therefore, boilers should not be selected from a catalogue's rating, but should be selected from their evaporating power. In figuring the amount of radiation required for garages the roof must be taken into consideration, as most garages have no air space between the ceiling and the roof, and the heat loss is nearly as great through the roof as through the walls. All skylights should be protected with coils or radiators to prevent down drafts. The placing of either pipe coils or wall radiation should be under the windows. The boiler room should be excavated so as to keep the radiation near the floor. If this cannot be done, the returns should be brought back to a receiver and pumped from there to the boiler. An electric driven pump can be used when the steam pressure is not great enough to run a steam driven pump.

The laws are quite strict in regulating the placing of a heating plant in public garages It is stipulated that the boiler room in all garages capable of containing five (in some cities, ten) or more cars must be entirely enclosed in fireproof construction and entirely separated from the garage proper. The entrance to such a boiler room must be from the outside of the building.

With the knowledge of heating as applied to large garages, and with the protective measure enacted to make such installation safe and secure, it is all the more astonishing to find that many single and two-car garages are not equipped with heating units giving a reasonable degree of safety.

Concrete Oil Tanks—II. Means of Oilproofing

By JOHN H. HESSION
Assoc. Mem. American Society of Civil Engineers

To reduce the probability of cracks in the concrete the steel stress should be kept down to 10,000 pounds. On circular walls, where concrete acts wholly in tension, it is advisable to figure the concrete sufficiently strong to carry the load without the assistance of the reinforcement, in order to obviate cracking. It is recommended that the tension value of concrete be taken as 75 per cent of the ultimate in tension; hence for a 1 : 1½ : 3 mix, whose ultimate is 200 pounds per square inch, the wall tension would be figured at 150 pounds. The steel should be sufficient in itself to stand the bursting pressure at 10,000 pounds per square inch, without dependence upon the concrete.

Connections. All connections to the tank should be made from the top. This is essential because in concrete tanks some difficulty is experienced in making absolutely tight connections. Should any break occur in connections at the bottom of the tank, there is danger of losing the entire contents, whereas with top connections the loss would be under better control.

Vents. The ventilating of the fuel oil tank is an important feature. This is necessary in order to permit a supply of air to enter the tank when the oil is withdrawn, as well as to allow the gases to escape. The vents also serve the important purpose of preventing flames and sparks from getting into the oil and of avoiding spontaneous combustion. There is a variety of patented vents on the market, all of which have good points, but the architect must use care in the selection of this equipment. The vent should be examined from the standpoint of automatic control of the vapors. In other words, if vapors are passing out through the vent and, by some unfortunate circumstance, should become ignited either by lightning or sparks, the vent should be arranged so as to shut off automatically the flow of vapor. It is necessary to provide a device that is automatic, so that the vent may be kept open under ordinary conditions to permit a flow of air to enter and also to close instantly when the need arises. Without some such device the use of heavy oils may almost be a serious menace.

The vents should be extended to a point above the top of the structure in which the oil tank is located, and should have an additional fresh air inlet provided with an automatic check valve so that when suction occurs in the tank the check may open to admit air.

In Massachusetts the study of oil-tank installations, especially where used in connection with heating units of commercial or public buildings, has been conducted by the Fire Prevention Commissioner. In all such instances the location of the tank, the arrangement of fill pipe, the ventilating system and the general problem of safeguarding life and property have been carefully analyzed. It is rare, indeed, when two installations, identical in detail, may be encountered, and it is all the more important that the architect should be thoroughly familiar with the best practice in the construction of oil storage tanks.

Oilproofing. If every care is taken in the design and construction, the resultant tank should be practically watertight. The construction is really of more importance than the design, as a poorly designed tank when carefully constructed will be very likely a much greater success than a correctly designed tank poorly built. Perfect work is essential in tank construction, but is difficult to secure owing to the class of labor that must be used and the ease with which a slight oversight may occur that will mar the results. An oil tank must be watertight and it can be made so if it is perfectly done; but such perfection is difficult of attainment in ordinary practice.

If the tank is watertight, it does not necessarily follow, however, that it will also be oiltight. Experiments have shown that small concrete vessels, which were able to hold water perfectly, have, when filled with oil, lost the entire contents in four days. This was a gasoline oil. The result with fuel oil would not be so serious. It would depend entirely upon the gravity of the oil. Even a heavy oil when highly heated becomes very thin and flows readily. It is for this reason that heavy oils must ordinarily be heated in order to be pumped. In this thin condition, oil has very much greater penetrating power than water. The need for oilproofing is, therefore, apparent.

The mixture of an integral compound in the concrete mass for oilproofing, while tending to better concrete, brings up problems which are not involved where a surface treatment is used. The integral method cannot compensate for poor workmanship or materials in the concrete, or for cracking due to settlement, contraction or other reasons. With the right surface treatment these imperfections can be remedied. Integrals cannot of themselves prevent oil attacks on the cement in concrete, but a cement-free surface coating will.

A surface treatment of oilproofing is essential if a tank is to be put to use within two months after

completion. Practically all oils will attack "green" concrete; while high gravity oils, such as kerosene and gasoline, have been known to attack old concrete. The oil in attacking concrete seems to have a softening effect which gradually disintegrates it. It may be well to state that many different views are held as to the action of oil on concrete. Some hold to the opinion that oil of the heavy type has no deleterious effect; others are equally firm in maintaining the position that oil destroys the cohesive action of the cement particles. If the cement has passed through the crystallization period, the probable destruction, due to the presence of oil, is very remote. Under other conditions, the chemical reaction between the cement and oil may lead to the "breaking down" of the mass. In order to harden the concrete more quickly, the tanks are sometimes filled with water and seasoned a month.

Silicate of soda is sometimes used to harden the surface of new concrete in order to permit using the tank somewhat earlier than the water cure allows. It should have a strength of 40 degrees Baume and should be brushed on in three to four coats of one part soda to four parts water, the final coat being one to two or one to one. This solution enters the surface pores, but does not penetrate very far into the mass. The purpose is to permit the concrete behind the surface to harden free from the presence of oil. Surface hardening is the main property of the soda application. It is not waterproof. If, therefore, the surfacing is perfect, good results should follow. If imperfect in any way, oil will go through the treatment into the concrete mass with probable resultant failure.

The silicate of soda treatment is good only for heavy oils. For lighter oils, magnesium fluo-silicate has been used, with a covering of spar varnish. The duration of this treatment has not yet been definitely determined, but it is known that the varnish cannot withstand water; and water is inevitably present mixed with the oil, also it appears as condensation on the inside surfaces of the tank.

A system of oilproofing which has given good results has been found in the use of cement surfacing. A coating of one part cement to three or four parts sand applied in two coats, the first a scratch and the last a finish, will, if well troweled, produce cement crystals which tend to make a watertight surface, and therefore a good barrier against the very heavy oils. Frequently, in addition to the mortar, there is incorporated some patented or other article whose purpose is to give extra waterproofing quality to the cement through colloidal or other action. One method extensively used is a coarsely ground iron similar to that used as a floor hardener. By thoroughly troweling the mortar, an exceedingly hard surface can be secured, owing to the presence of the iron. Unfortunately, the use of a plaster coat requires a large amount of cement, which accordingly presents the possibility of oil attack.

Another satisfactory method of oilproofing on the market is the "iron system." This consists of a finely pulverized iron, to which a chemical has been added that oxidizes the particles. The pulverized iron comes to the job in dry form, and after the addition of a suitable amount of water it is brushed on the concrete surfaces. The minute grains of iron are carried by the water into the surface pores, and as the water dries off, oxidation ensues, which causes the iron particles to expand and fill the pores. By filling the pores it is analogous to the colloidal action of some of the integral methods, and after the chemical action is complete, it may be likened to rust embedded in stone.

The brush applications number from four to six, though it may be necessary to carry on up to eight or ten, depending on the concrete and the conditions under which the work must be done. After the iron has been applied, the result is a thin but exceedingly dense and impervious surface of iron oxide, which appears to be free from all harmful reactions with oil.

To repair cracks with the iron system or any surface treatment, the openings must be carefully cut out to clean, hard concrete. These cuts are then filled with the same mixture of oilproofing as in the original treatment. When iron is used, the iron swells while the cement contracts, but sufficient iron must be added to produce a net expansion. Hence the filling tightens itself against the sides of the crack, definitely preventing leakage.

The oilproofing work should be done at the time the tank is constructed, because it is an exceedingly difficult and expensive matter to do oilproofing work after oil has once been introduced into the tank. The reason for this is that the surface pores become filled with oil and offer no chance for a bond for the oilproofing. It is necessary under such conditions to remove the oil filled surface by chiseling it off, or a new wall must be built to furnish a suitable surface. On a tank which is leaking badly, it may be useless to try to chisel the surface as the concrete very likely may be thoroughly saturated and additional chipping merely exposes another surface of oil filled pores. A new wall is the only recourse in such a case. Furthermore, the oil sludge in the bottom of the tank emits gases that are poisonous, and to remove them requires pumping for long periods. Often the workmen need to be provided with gas masks or diver's suits, which makes the work slow and expensive. Oilproofing is another instance where "an ounce of prevention is worth a pound of cure."

Concreting in Winter

By RAYMOND K. TURNER

CONCRETE work during winter is carried on in these days almost as extensively as in any other season of the year. Of course there are some precautions to be taken in winter work, although experience has shown that observation of simple rules for preparing concrete mixtures, followed by simple means of protecting the new work, will produce the best of results even under extremely cold weather conditions.

Most large contracting concerns consider their working season to extend throughout the whole year, regardless of season and temperature. It is true that there is some slight extra expense involved in conducting work under winter conditions, due to the extra precautions that must be taken. However, from the standpoint of all involved, it is quite worth while. The labor market and the material market are each benefited and relieved by the continuous working season; while from the standpoint of the builder he may benefit by an agreeable money market or a release of his structures completed at an earlier date.

Cold appreciably delays the hardening of concrete. This may be explained by the fact that temperature is known to control the rate of all chemical reactions, cold retarding chemical unions by affecting the quantity and quality of binder elements. Then, too, some solutions or parts of the chemical mixtures are active under high temperatures, but inactive under low temperatures. The fact is that cold weather concretes are slow setting and of low strength during the cold period.

If frozen before initial set has taken place, concrete, will upon an increase of temperature, thaw out and then attain a solid with seemingly no impairment of strength. This holds particularly true in mass work where a sufficient head is obtained to compact the mass that has been held apart by the formation of ice particles. If concrete passes through a series of these changes of alternate freezing and thawing, it is almost certain to be badly decomposed.

A careful selection of a good Portland cement is necessary in winter work. Not only should the cement pass the Standard Specifications, but it is advisable to have it quick hardening and developing high strength at early periods. The aggregates should be carefully selected, avoiding especially a very fine sand or a sand containing even a small quantity of vegetable loam, since a reduction of early strength is liable to result from the use of these materials.

Heating both the water and the sand and stone aggregates before mixing is the best precaution to take during periods of low temperature. By this heating of the constituents, the concrete mixture will be so warmed that rapid hardening will take place before freezing sets in. It is not sufficient to heat the mixing water alone unless the aggregates have been stored indoors in such a way as to give them considerable heat. When sand and stone are stored in the open, they are very likely to contain frost or pieces of snow and ice. Since the cement forms but a small bulk of the concrete, it need not be heated. However, it is well to store it indoors so as to protect it from severe cold. Mixing water is easily heated in any one of several ways which are most convenient for the particular job. Live steam or exhaust steam is sometimes run into the water tank, or coils or tanks may be so arranged over a fire as to produce a sufficient supply of heated water. Excessive heating of the water should be avoided as it may accelerate too much the setting of the cement, producing what is called "flash set." The sand and stone aggregates are best heated separately, so that segregation can be obtained until the mixture is ready to be proportioned.

On small jobs the aggregates can be piled over and around metal cylinders which may be fired with wood. Care must be taken not to allow the material resting against the cylinders to become too hot, as excessive heat has a deteriorating effect on some aggregates. When the aggregates are heated over cylinders, it is necessary to turn them over frequently so as to guard against this excessive heat and also distribute the heat throughout the pile. Steam jets are sometimes run into the piles of materials, or the material is piled directly on steam heated pipe coils. When the aggregates are stored in bins, heated pipe coils are often arranged so that the materials on leaving the bins pass between the coils. This method offers a means of imparting an even heat to the materials, provided they are used immediately after being taken from the bins. Steam is often applied directly to the piles of aggregates, but this is likely to be an inefficient method unless the materials are so covered with tarpaulins as to retain the heat. The coverings act as an efficient house for the piles of materials, preserving the heat imparted to them, and also preventing the materials from becoming watersoaked or even frozen solid if the temperature should drop extremely low. In judging temperature of these materials, it is best to use a thermometer rather than trust to an unsensitive, calloused hand.

Various substances such as common salt, calcium chloride and even glycerine and alcohol have been

added to concrete mixtures to prevent them from freezing. It is true that all of these substances lower the freezing point of the mixtures materially. However, this advantage is offset by other effects. Glycerine and alcohol both tend to lower the final strength of the concrete, while too much glycerine is objectionable because of its organic nature ; decomposition is very apt to set in, thus damaging the concrete. Common salt was used quite extensively in the mixtures when concreting in cold weather was first done. The mixtures procured in this way have a very low freezing point, but the quantity of salt used should be carefully regulated. Salt also tends to delay the set of the mixture as well as to produce a concrete of lower final strength. The use of salt in reinforced concrete is liable to be very objectionable, since salt mixtures will corrode the reinforcement, and there is also apt to be danger of electrolysis under some conditions. Salt also tends to produce a white surface scum commonly called efflorescence, which is unsightly on finished work. Use of calcium chloride has many of the same objections as are derived from the use of salt, although calcium chloride has the beneficial effect of hastening the hardening of concrete. Although there are some benefits in using these anti-freezing mixtures, the ill effects are so numerous that it is perhaps best to omit them.

The condition of the forms should be carefully investigated before placing concrete mixtures in cold weather. All particles of snow and ice and frozen concrete should be removed. Metal forms should be heated, while in extremely cold weather wooden forms should have a jet of steam turned against them or wet down with hot water so as to raise their temperature. It is well to turn steam on the reinforcement after it has been placed in very cold weather. This tempering of both forms and steel should take place immediately before the warm concrete mixtures are placed in the forms, so that there will be as little wasted heat as possible. The size of concrete batches mixed in cold weather should be so arranged that each mixer load can be quickly transported to the forms with as little loss of acquired heat as possible.

In building construction it is customary to enclose the structure in canvas when low temperatures are liable to be encountered. Within this canvas enclosure, heating units are so arranged as to keep the temperature somewhat elevated. Since warmth and moisture are necessary to effect the proper hardening of concrete, this is obtained by the use of stoves or salamanders. Pans of water are frequently placed on these stoves to produce a moist heat. Newly laid work is frequently covered with hay, straw or clean sawdust, and usually canvas is so placed as to provide an enclosure which may be warmed by steam or by allowing warm air to come up from the floor below through holes left for the purpose. Finished floor surfaces should be carefully protected, since many protective coverings are apt to be injurious. Manure, for example, should never be placed directly upon fresh concrete. The heat of manure is derived from the decomposition of its organic matter, and in this process nitric acid frequently forms, which will cause a surface injury to the concrete as well as an unsightly stain. Work should be protected as soon as completed, and under no circumstances should the protection be removed until it is assured that the concrete has hardened.

The removal of forms at too early a period should carefully be guarded against in winter work. In cold weather the concrete mixture sets very slowly, and even though frost does not enter the mixture, an extra period should be allowed for this delayed set, or hardening. Concrete which has frozen has often the appearance of thoroughly hardened concrete. When the mixture is struck with a hammer, it will produce a ring very similar to hardened concrete. The work should be carefully examined before the removal of forms, especially in the case of walls or slabs which are intended to carry loads. Small portions of forms may be removed and the exposed surface carefully examined. It is best to apply a heat test to the surface by directing upon it a jet of live steam or a flame from a blow torch.

The general rules which might be applied to concreting in winter, varying in their application, of course, with the exact conditions encountered, are therefore as follows :

1. Use care in selecting good materials.
2. Have the forms in such a condition as to receive the concrete without producing an appreciable lowering of temperature.
3. Preheat both the water and the aggregates.
4. Mix, place and protect the concrete so that initial hardening will take place before the work is exposed to freezing temperatures.
5. Guard against a too early removal of forms, making sure that the concrete has really set and not frozen.

These principles will also apply to stucco work, but in a good many cases when exterior stucco is applied in winter there is no great importance to the question of uniform strength, and a liberal application of salt in the mixture will permit the initial set to take place before freezing.

Another thing that it is well to bear in mind is that foundation work, strange as it may seem, does not freeze with any great degree between the forms so that if the top of the concrete is covered with salt hay, there is little danger of any damage.

ARCHITECTURAL & BUILDING ECONOMICS DEPARTMENT

C. STANLEY TAYLOR, *Associate Editor*

How the Annual Insurance Cost on Large Structures can be Reduced by Proper Design

I. BY THE EFFICIENT PROTECTION OF EXTERIOR OPENINGS

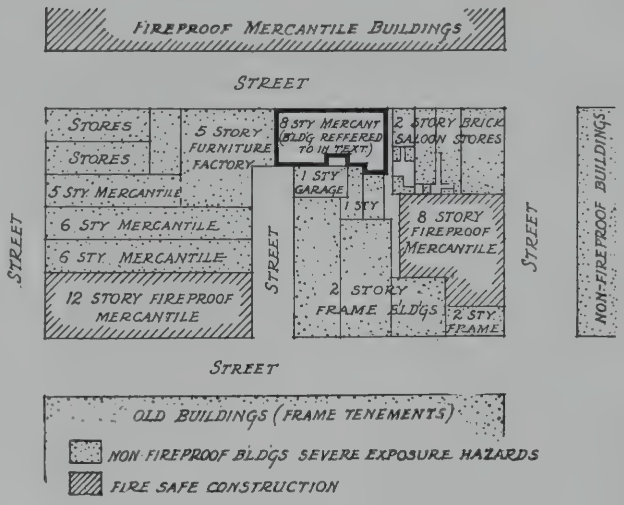
THE question of reduced insurance cost on buildings through the medium of design and specifications developed from the viewpoint of safer construction is one which is constantly being given more serious consideration by the architect. On the other hand, the architect cannot well be expected to be entirely conversant with fire insurance rating methods; in fact, the development of fire safe buildings has been actually placed upon a scientific basis and is now commonly known as Insurance Engineering. On many large buildings constructed within recent years, such as the Equitable Building in New York City, the method of achieving reduced insurance rates and increased safety against fire has been to place the architect's plans in the hands of a capable insurance engineer for the purpose of making various structural and equipment changes which would result in the desired reduction of insurance rate and increase in safety.

It is evident, however, that the more important features of Insurance Engineering are well within the grasp of the architect if he will give some study to the subject, and as many buildings are not submitted to insurance engineers, the average architect's service to his client in connection with the design of a large building can certainly be broadened by some consideration of the features of fire prevention and protection.

Therefore, from time to time consideration will be given in this department in a brief manner to the structural and equipment details by which insurance reduction may be achieved; but particularly to the actual business side of the problem, involving the amount of reduction which may be expected and explaining how insurance rates are made up, and what additional reduction in annual cost to the owner may be expected when better protective measures are incorporated in the design and specifications of such buildings. In this article the subject under consideration is that of safeguarding building exteriors against communicated fires through the medium of protecting hazardous exterior openings to withstand any possible entrance of fire from adjoining windows. The importance of this feature is clearly recognized by insurance companies in making up their rates, as will be shown in later paragraphs.

Briefly considering the danger of communicating fires, we find that approximately 60 per cent of our national annual fire loss is due not to fires originating within the building, but to communication from adjoining risks. Practically all great conflagrations have clearly demonstrated this point, and it is evident that no matter how carefully the interior of a building is designed and constructed it must necessarily partake of the potential fire hazard of surrounding buildings. Thus every section of a building exterior which is in any way exposed to an adjoining risk must be equally fire resisting. In other words, the roof and exterior openings must be so constructed and so protected against exposures that fire cannot enter any more readily than it would through the masonry walls of the building. At first consideration it would seem that the danger of communicated fires would not be as severe in buildings of masonry construction as that of interior fires; but general experience has not only proven the contrary condition to exist, but has shown clearly that both exterior and interior exposures must be guarded to obtain that degree of immunity from the great direct and still greater indirect loss incident to fires of any type.

Architects, builders and property owners have in the past and are to-day giving far too little thought to this matter of protection against exposures, and particularly the question of exterior openings. Nowhere in the world will be found such combinations of bad exposures and negligible protection as may be found in any of the cities, large or small, in this country to-day. It is almost impossible to select a site for the erection of any type of building, from a home to a great office or mercantile structure, without encountering immediately the problem of serious exposures. And is this problem generally recognized? Does the architect or the owner realize the continually existing danger of fires communicating from other buildings? Is it generally realized that of a building's entire fire risk, that from within the building, on the average, is estimated at 40 per cent, the other 60 per cent of the risk being from fires without?



It would seem not, if one judges by the hundreds of buildings which are being erected every year with scarcely a thought on this subject. Every day fires are occurring which prove the fallacy of building without proper protection against exterior exposures and also proving the utter uselessness of temporizing by the use of cheap and inferior forms of protection, by the use of plate and common glass, where common sense advises the use of wire glass, and of sub-standard, poorly designed types of exterior opening and roof protection.

It may also be convincing to note that the United States Geological Survey clearly recognizes this condition and the need for its remedy, as will be shown by the following interesting excerpt from "The San Francisco Earthquake and Fire," published by this department about ten years ago:

> "While the fire danger from exterior fires to a given building is ordinarily estimated at 60 per cent, this risk practically becomes 100 per cent, of course, in a great conflagration. In San Francisco little protection from exterior fires had been adopted. There were few metal shutters or steel-roller shutters, and most of these were of imperfect design, proving unsatisfactory when tested. The openings in walls were fatal weaknesses in all the great buildings. Wire glass windows, though few in number, behaved well, but wooden instead of metal sashes were great sources of fiery contagion. Metal covering over wooden doors and window frames was generally inefficient. Ordinary glass was quickly cracked by heat from the exterior; the sashes took fire and the flames rushed in through the openings, consuming all combustible material within. Had they been furnished with metallic shutters of the best design, with wire glass in metal sashes, and with cornice and other exterior sprinklers, supplied by a private water plant, they certainly might have been saved."

While during the years since the San Francisco conflagration the trend of building construction has been slowly turning towards consistency and safety, the fact is evidenced more by improved building codes in the larger cities than by increased interest on the part of the building public. Those who design, build and own buildings must sooner or later come to realize the need for consistent firesafe construction; must realize that safety from fire lies in the original construction and equipment of every building, and *now* is the time to study such problems as that presented by exposures.

In speaking of the Baltimore conflagration, F. W. Griswold, then general inspector of the Home Insurance Company of New York, said in 1904:

> "It is my most assured judgment that, notwithstanding narrow streets and inferior construction of buildings, the fire would not and could not have seriously spread had proper precaution been exercised in the protection of exposed wall openings, together with the use of non-combustible cornices and roof trim; and, in at least partial support of this assertion, it is a fact that where wire glass in metal frames (though not the best) was exposed to the heat of the conflagration, both front and rear, no damage by fire to the interior resulted; while in the case of imperfect metal-clad shutters, such as appear to have passed as approved, but little restraint to the spread of flame is evidenced, and this is also true of wire glass, where it was encased in metal-clad wooden frames and sash."

From the insurance viewpoint the term "exposure" may best be defined as a possible source of communicated fire. Exposures are both interior and exterior.

An interior exposure is a subdivision of space within the walls of a building which will not confine a fire which may originate therein, but will allow such fire to spread throughout the building.

An exterior exposure is that which presents the potential hazard of communicated fire.

For the purpose of this article, exterior exposures alone will be considered, and the general conditions and types of structures which constitute serious exposures will be considered in detail in later paragraphs.

Exposure protection necessarily resolves itself into an individual consideration. Ordinarily no two buildings are of necessity protected in exactly the same manner, as no two buildings bear the same relative location to the exposures involved. Obviously, then, the first step is a careful consideration of the location of the building in question and its present and probable future surroundings. What are the exposure hazards, or what are they likely to be? Is there danger of fire spreading from nearby buildings? Is there a possibility of new buildings being constructed near by which will present the menace of spreading flames?

It is plain that the exposure is not so great in a residential neighborhood or in a district where the surrounding buildings are of fireproof construction or contain little inflammable material as it would be if it were where the building site was surrounded

Comparative Exposure Table

Calculate the initial charge, as per tables, for given distance or condition for each side and enter in its column, add or subtract from charge as follows, carrying the net result by successive processes down the column to the bottom.

RISK	EXPOSURES											
	1. Openings protected by wire glass in metal frames and standard fire shutters and doors.				2. Protected by wire glass in metal frames or by standard shutters.				3. Wood sash and plain or plate glass.			
	FRONT	RIGHT	REAR	LEFT	F	RT.	R.	LT.	F	RT	R.	LT.
Height.....8.....	- - -	5										
Rate.....25.....	- - -	1.60										
Distance.....	- - -	adj.										
Adjoining:.....	NO EXPOSURE											
Party Wall.....		-				SA	ME			SA	ME	
Independent Wall.....												
Windows Over.....		yes										
Communicating.....												
Length of Side:.....												
A-Risk.....	- - -	60'										
B-Exposure.....	- - -	60'										
Tables Used.....	- - -	7-14										
BLANK WALL OF RISK towards exposure deduct ⅘ of charge. (*No deduction if wooden cornice or mansard.*)		.020 .136 .156	.097	.076		.020 .136 .156	.097	.076		.020 .136 .156	.097	.076
" " OF EXPOSURE towards risk, deduct ⅛.												
" " TO BOTH deduct 90 per cent.												
OPENINGS NOT OPPOSITE each other deduct 30 per cent.												
" ON GRADE OR FIRST FLOOR ONLY, deduct 25 per cent.												
SHINGLE ROOF TO RISK increase charges 50 per cent. but not exceeding a sum which would make risk equal rate with exposure.												
✓LENGTH OF EXPOSED SIDE OF RISK.—Less than 75 running feet, 1 per cent. less for each foot. *No deduction if adjoining with communication.*	- - -	.023 .133	.017 .080	.008 .068		.023 .133	.017 .080	.008 .068		.023 .133	.017 .080	.008 .068
✓ " OF EXPOSURE.—Less than 75 feet, ½ per cent. less for each foot.	- - -	.009 .124				.009 .124				.009 .124		
✓HEIGHT OF EXPOSURE.—If less than 5 stories deduct 15 per cent. for each story less than 5. If over 5 stories and non-fireproof add 25 per cent. for each story over 5.	- - -	- - -	.036 .044	.031 .037			.036 .044	.031 .037			.036 .044	.031 .037
FALLING WALL HAZARD.—Add not less than 2 per cent. of the rate of the exposing risk.												
GLASS FRONT OR SIDE OF RISK.—Increase charge 10 per cent. if first story, 20 per cent. for second, and 10 per cent. for each additional story.												
" OF EXPOSURE.—Increase charge 20 per cent. for each glass story above first or grade floor.												
✓STANDARD FIRE SHUTTERS or approved Wire Glass Windows. ✓ To window openings of risk.....40 per cent. ✓ If both.....60 " " To window openings of exposure.....33⅓ " " If both.....50 " " To risk and exposure.....45 " " If both.....67½ " "	- - - - - -	- - - .074 050	- - - .026 018	- - - .022 015	- - -	.050 .074	.018 .026	.015 .022				
NOTE.—Approved open sprinklers accepted as equal to standard fire shutters.												
LARGE AREA OF EXPOSURE exceeding 10,000 square feet and height exceeding intervening distance increase charge 20 per cent. and add a further 2 per cent. for each 1,000 in excess of 10,000.												
FRAME RISK increase charge 50 per cent. but not exceeding a sum which shall make rate of risk equal to 80 per cent. of exposure.												
✓IF BOTH RISK AND EXPOSURE RATES ARE BELOW 1 PER CENT.—Take such percentage of final result as the rate of risk bears to 1 per cent. *e. g.* if 65 cents, 65 per cent; if 45 cents, 45 per cent., etc.			.004	.004			.007	.006			.011	.009
Total Exposure Charge for all sides.		050	.004	.004 .004 .050		.074	.007	.006 .007 .074		.124	.011	.009 .011 .124
HEIGHT OF RISK.—If under five stories high, deduct 15 per cent. of total charges for each story less than five. If over five stories high and non-fireproof add 15 per cent. for each story over five (not exceeding 75 per cent.)				.058				.087				.144
✓ Deduct for Working margin 20 per cent.	- - -	- - -	- - -	.012	- - -	- - -	- - -	.017	- - -	- - -	- - -	.029
THE EXPOSURE as computed under the table, shall be reduced as follows before being incorporated into the rate:—		BUIL	DING	.046				.070				.115
(*a*) By 18 per cent. in the case of the building for a risk rated on Non-fireproof Mercantile Schedule.			- - - -	.012	- - -	- - -	- - -	.018	- - -	- - -	- - -	.029
(*b*) By 30 per cent. in the case of the building, and 7½ per cent. in the case of the contents for risks rated on a non-fireproof schedule other than the Mercantile.		CONTENTS		.034				.052				.086
(*c*) By 65.6 per cent. in the case of fireproof buildings not rated on the Mercantile Schedule.												
(*d*) By 25 per cent. in the case of contents for all fireproof risks, subject to further deductions in conformity with the following table:—(as per F. P. E. M. Schedule).												

NOTE. The above tables show plainly the lowering of the exposure rate of insurance by proper use of standard forms of exterior opening protection.

Digest of calculations is as follows:

	BUILDING	CONTENTS
Wire glass, metal frames and standard shutters and doors.....	.046	.034
One of above with standard doors.....	.070	.052
Without protection.....	.115	.086

by non-firesafe structures or are used to house businesses which necessitate the handling and storage of highly inflammable matter.

In the planning of large buildings to be located in or near residential districts, one important factor must not be overlooked. That is the question of the conflagration hazard. If the residential district in question is closely built up of frame houses having wood shingle roofs, a conflagration hazard undoubtedly exists. The records of almost all great conflagrations show flames traveling by the wood shingle and frame construction route straight into the heart of the mercantile or business section. Where it is planned to construct a large building in a section which is thickly built up with frame and wood shingled dwellings, the exterior of the building must be made absolutely fire resistive.

At first glance a large group of frame dwellings does not appear to offer any serious fire menace to a large building. It would seem impossible for sufficient heat to be generated to do serious damage; but fire records tell a different story. High winds and dry wood on the roofs and in the walls of dwellings menace thousands of mercantile buildings in this country to-day, and such exposure must be guarded against.

At Salem, Mass., the great conflagration started in the mercantile district, traveled out through the residential district along shingle roofs and frame houses, circled down towards the waterfront and set fire to the Naumkeag Mills, causing a $3,000,000 loss there. This was in the second conflagration, immediately following the first, which had practically died down when a shingle roof on a school, across the valley in South Salem, caught fire from flying brands and created another conflagration, which resulted in the destruction mentioned.

The Severity of Exposures

There are many factors which must be taken into account in the consideration of the severity of an exposure, and it is naturally difficult to give any definite requirements determining the degree of exposure. In general, however, serious exposures are as follows:

(*a*) A building of combustible type, 25,000 cubic feet or more in size, and located within 40 feet of the structure in question.

(*b*) A smaller building within the same distance and containing highly inflammable material: such as a moving-picture theatre or building in which nitro-cellulose films are stored; garage or any building, such as used for the storage of oils, paints, varnishes or any material which would serve to create a quick, hot fire.

(*c*) If the adjacent buildings are of combustible type and have large areas such as a theatre or contain a large amount of inflammable material such as a furniture or piano factory, they constitute dangerous exposure to a distance of 70 feet.

(*d*) If there are a number of combustible buildings within an area of 250 feet from the building, so that a fire might become general in this area, the conflagration hazard exists and a serious exposure hazard is constituted.

(*e*) If the proposed building is located in a conflagration district, it should be considered as seriously exposed.

The amount of protection which will be provided, will, therefore, depend on surrounding buildings, their construction, contents and distance from the building in question.

In general, the following rules should be followed, modified somewhat, of course, by existing conditions:

The exterior walls of fireproof or sprinkled mill constructed buildings should be of at least 12 inches of masonry. In case party walls are used these walls should be not less than 16 inches in thickness. All walls should have a parapet not less than 3 feet high. All doors in party walls should be of a type of fire-door approved by the Underwriters' Laboratories, one on each side of the wall. All outside doors should be of metal.

Wire glass windows in metal frames and sash offer excellent protection against moderate exposures and prevent the passage of flame from floor to floor through the windows. All windows above the third floor should be of this type, and in the matter of three-story buildings and the lower three floors of higher buildings great care must be taken before the use of wire glass is decided against. The exposures must be studied carefully, keeping in mind the size of the building, the advantages of wire glass from the breakage as well as the fireproofing standpoint, the expense of changing to wire glass at a later date should exposure conditions be made more severe, the fire-fighting facilities of the community, and the insurance saving where wire glass is used.

In the selection of metal frames for wire glass windows, the weatherproof qualities must not be lost sight of. Some types of metal sash and frames corrode quickly and should be avoided, the architect insisting on assurance as to this point from the manufacturer.

Where windows are seriously exposed they should be protected by properly constructed shutters in addition to wire glass.

Having considered, in a general way, the conditions which create exposures of a more or less serious nature, the natural question is how to

guard against these exposures in the most practical and efficient manner, considering always the factor of cost — and right here a digression will be made to emphasize this matter of cost.

The Cost Factor

From the standpoint of those who purchase structural materials, cost can no longer be defined as the amount of money paid for a material or device. We build our buildings for permanency; our office buildings, hotels, warehouse and mercantile structures are erected with the idea that they will stand for many years and give good service: therefore, the *real* cost is the ultimate cost and can better be defined as the total expense of the installation and maintenance of materials and devices, plus or minus the insurance credit or penalty granted or imposed for the use of the product in question. In other words, in the consideration of the protection against exposures, various questions of cost vs. ultimate cost must be decided. For instance, window frames and sash of solid or hollow steel have a far higher degree of permanency and necessitate a much lower cost of maintenance than those of metal covered wood, at the same time offering far greater safety. It is false economy to let the lower first cost of metal covered wood windows influence the builder to install this type, or wooden windows or metal windows of inferior design and workmanship; it is false economy to use plain glass where wire glass should be used, even though the risk seems slight, or tin clad doors when all metal doors may be obtained at a slight increase in price. Buy with the sure knowledge that safety and permanency are the cheapest in the end.

A Practical Example

With this view of the cost proposition in mind, let us consider a practical example of protection. The accompanying block plan will serve as a basis on which to work. This shows an ordinary city block in a mercantile section. We are considering the construction of an eight-story mercantile building in the location designated by the heavy line.

A study of the map shows that this building is exposed on both sides and the rear to a severe conflagration hazard, which in itself necessitates the utmost care in design. The five-story furniture factory immediately adjoining constitutes a severe exposure, containing as it does a hazardous occupancy where much inflammable material in the form of wood, paints and oils is used and stored, and being of joisted brick construction. A fire in this building would most seriously threaten the structure under consideration, and for this reason the best known protection for window openings should be employed. This consists of wire glass in metal frames and each opening further protected by the use of automatic steel shutters from the terrific heat which would be generated by a fire in this building. If there are door openings on this side, they should be protected by automatic metal fire doors. All protection should be of types approved by the Underwriters' Laboratories. In this manner the side of the building in question, which we will call the west side, has every opening in the masonry wall protected in such a manner that in case of fire in the furniture factory the heat would cause the automatic doors and shutters to close when the fusible links with which each is equipped has been melted. Here we would have a standard fire door barring the progress of the flames, heat and smoke through the door openings, and metal shutters backed by wire glass and metal windows, protecting the window openings — a solid, impenetrable wall against which the flames will seek entrance into our building in vain.

On the opposite, or east side, of the building we have different conditions entirely, the building adjoining being only two stories in height. The exposure here is severe at the lower stories. All windows should be of wire glass in metal frames, and all windows over the roof of adjoining buildings to a height of 30 feet should be equipped with steel shutters.

On the rear, or south side, of the building all windows west of the court, being over the garage and also exposed to possible fire in the furniture factory, should be of glass in metal frames and equipped with automatic shutters. Windows in the shaft should be of wire glass in metal frames, while those east of the court would be of wire glass, shutters being necessary only opposite and one story above the one-story building adjoining.

The use of shutters as a further protection where the exposure is unusually severe is a precaution in case of the possible generation of heat that would cause the melting of wire glass. On these windows, shutters alone would not be sufficient protection because of radiant heat.

The walls in this building will, of course, be of at least 12 inches of masonry, and if steel framework is used, care will be taken to protect the ends of beams and girders so that they will not be affected by the heat of a nearby fire.

Reducing Insurance Costs

Definite proof of the value of proper protection against exposures will be found in the comparative exposure table shown herewith. A clear exposition of the actual working out of insurance rates will be of direct interest to those who plan commercial structures.

This table shows the method of working out the exposure charges on building and contents of the building heretofore discussed.

The final insurance rate on a building and its contents is made up of the rate on building and contents, plus the exposure charge. As we are only interested in the exposure charge for the purposes of this article, we will take for granted that the building rate (without exposure charge) is .25. Thus in the table the rate is shown as .25.

With this data and the information that the west wall of the risk is higher than the exposure and also pierced with windows, we find in referring to Table 7 of Exposure Rates, issued by the Insurance Board of New York and on which this article is based, that the initial exposure charge to be made against the building under consideration is .020. When the insurance rate of the building that constitutes the exposure is greater by .50 or more than the rate on the risk, an additional exposure charge is made which is found in Table 14. In this instance the rate on the former is 1.60 and on the latter .25, making a difference of 1.35, which as per the table calls for an additional charge of .136, as indicated at the head of the first column on page 43.

In the table on page 43 it will be plainly seen that the exposure rates have been figured three times, each time under different conditions of protection against exposure. The deductions from and additions to the initial charge will be easily understood if the left-hand column is carefully read. The buildings constituting the exposure of the rear and left side have a rate of insurance less than the five-story building at the right, and the difference between these rates and that of the building under consideration (.25) is less than .50, so no addition is made to the initial charge for these exposures.

Assuming the value of this building to be $250,000, and the value of contents $500,000, and using the rates obtained in the exposure table, we find:

Exposure charge on this building with exterior openings unprotected:

Building, $250,000, at .115	$287.50
Contents, $500,000, at .086	430.00
Total exposure charge	$717.50

By the use of wire glass in proper metal frames this is reduced to:

Building, $250,000, at .070	$175.00
Contents, $500,000, at .052	260.00
Total exposure charge	$435.00

By the use of steel shutters, in addition to wire glass, as extra protection against unusually severe exposures:

Building, $250,000, at .046	$115.00
Contents, $500,000, at .034	170.00
Total exposure charge	$285.00

It must be remembered that to the exposure charge saving shown here must be added the saving on the rate on building and contents, which is naturally reduced by proper exterior wall construction and the lowered cost of maintenance. This total saving alone is sufficient reason for properly protecting the building against exposures, and when increased safety and the factor of immunity against the disturbance of business and destruction of lives and valuable records are considered, the fact that many buildings are to-day being constructed without such protection is almost incomprehensible.

There is no doubt that proper safeguarding of a building along these lines adds somewhat to the original investment; but from a purely financial viewpoint it is evident that in the hypothetical building described in this article there would be a saving on the general insurance cost of approximately $1,000 a year, including both exterior and interior exposure reduction. This is a very conservative estimate, as the value of the contents carried in this building would probably be much greater than that given; consequently the insurance saving would be considerably increased. However, on a basis of 5 per cent on the additional investment, this would allow an extra $20,000, which could be well spent on the building, and which any owner being fully appraised of the value of such expenditure would not hesitate to authorize.

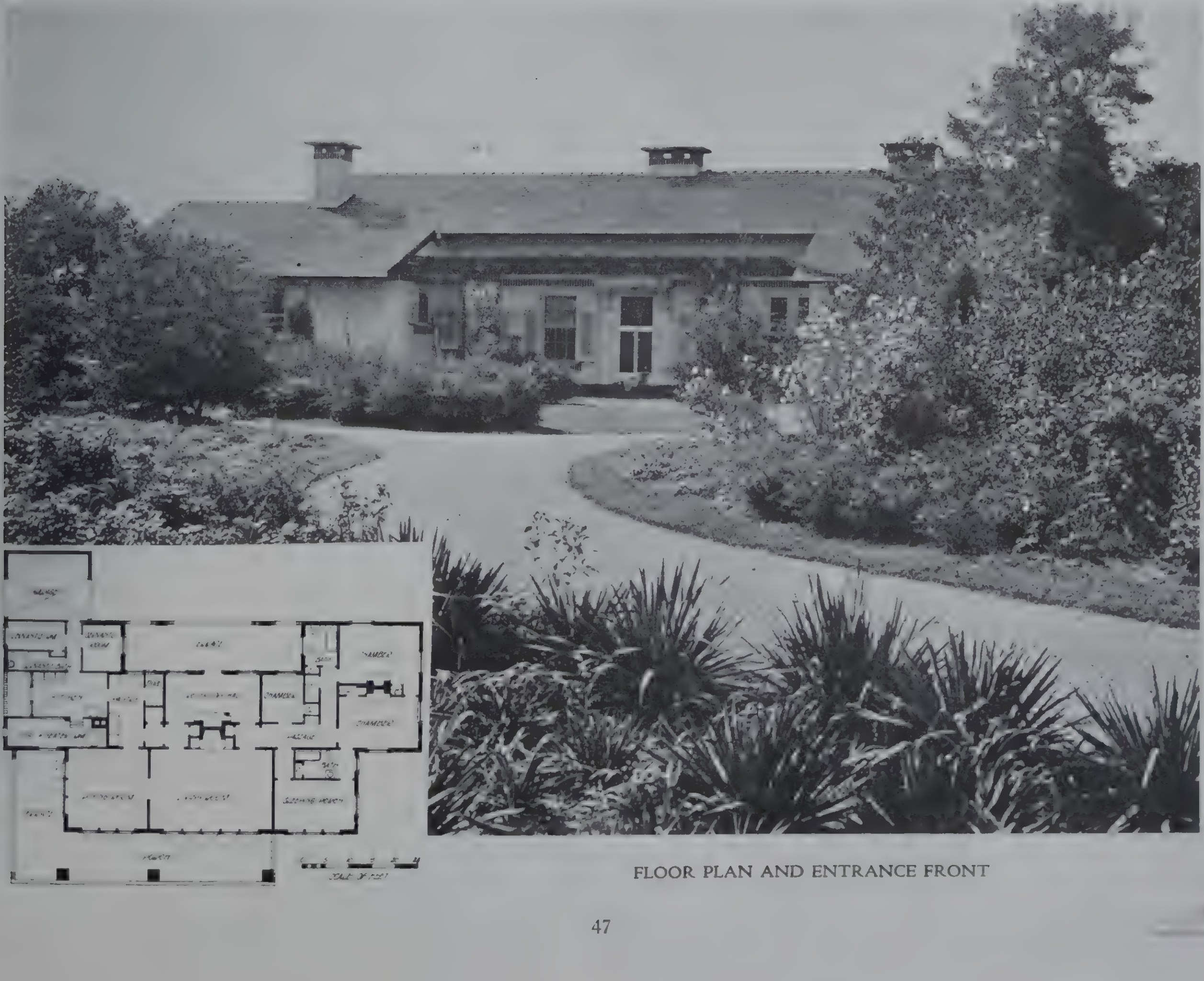
It may be interesting to architects to know that insurance engineering service is available to them and for their clients without direct cost. There are several large insurance agencies which maintain an Insurance Engineering branch to be placed at the disposal of their clients. Arrangements for this service in checking over plans and making recommendations in estimating the saving can be made through the medium of an agreement to place insurance through such agency. This is a service which architects would do well to take advantage of more generally. Insurance rating methods are being gradually standardized through the adoption of broadly applicable schedules and attention to matters of fire protection is rewarded by appreciable reductions in rates.

A Southern Bungalow, Norfolk, Va.

THE RESIDENCE OF CLARENCE A. NEFF, ESQ.

NEFF & THOMPSON, ARCHITECTS

THE GARDEN FRONT



FLOOR PLAN AND ENTRANCE FRONT

EDITORIAL COMMENT

TAX EXEMPTION FOR MORTGAGES

WITH the very large industrial expansion that is steadily taking place in many sections of the country, the problem of housing is reaching an acute stage and threatens more widespread and serious effects then during the critical period of the war. Efforts that are being made to meet the demand are sporadic and almost negligible when compared with the great need. The Atlantic coast section of the country is especially active in an industrial way, as is evidenced by data from the building department of New York City. In Long Island City, Borough of Queens, which in recent years has become a strong manufacturing center, factories are being erected at the rate of one every week, and in the neighboring Ridgewood and Jamaica sections at the rate of one a month. In comparison with this startling growth, the total inadequacy of housing facilities is seen in the fact that less than a dozen tenements were erected in the same borough during the past year.

This rate of industrial expansion will have to be curtailed unless something is soon done to provide the necessary houses for the workers. It is reported that one large manufacturing concern in this district has plans under way for the erection of 250 dwellings, and the aggravated conditions now existing are reflected in the requirement that at least two members of each family occupying a house shall work in the establishment of the owner.

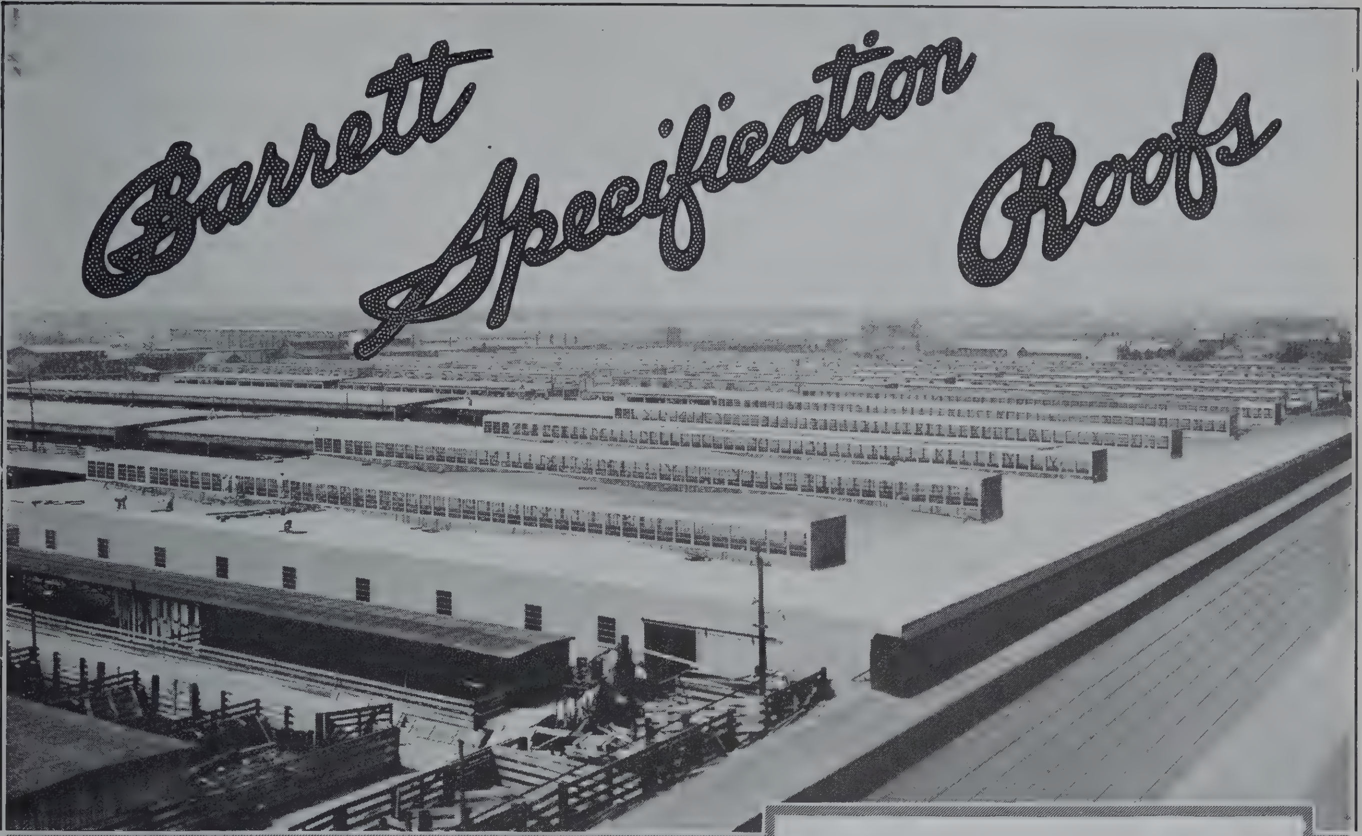
It is generally agreed that the most effective method of meeting the situation is through private enterprise and not through governmental participation, although such aid as can be given the movement by the Government without creating gigantic departments that often function with waste and extravagance should be made available. Private enterprise does not ordinarily interest itself in philanthropy or in movements for the benefit of humanity alone; it works for profit and reserves the right to devote its energies to those fields promising the greatest returns. The solution of the housing problem is no exception; it can be effectively solved through the use of private capital, but there must be a rate of return assured that will equal that obtained from other conservative investments.

At the present time the greatest obstacles to more building of residential character are the scarcity of money and the high interest rate holding on what money is available. Sources for large sums of money for building purposes are limited, and attempts made to meet the demand by distributing mortgages in small amounts entail an overhead cost that makes a rate approaching 7 per cent for the duration of the mortgage necessary to insure an adequate return.

The only definite and immediate prospect for substantial relief is in the passage of the bill known as H. R. 8080 now before Congress, which provides for the exemption of the income tax on mortgages not exceeding $40,000 in principal held by an individual. This goes to the root of the matter and if enacted into law will have a very beneficial effect on this distressing situation. Building materials and labor are without any question high and the supply is limited, but these conditions alone are not responsible for the lack of building. Apartment houses and other residential buildings that have been erected even at present high prices are proving profitable investments. In the Bronx section of New York rents as high as $22 per room are readily obtained and eagerly paid. The great difficulty, however, is the almost total lack of mortgage money to finance construction. This shortage is caused by the fact that income from mortgages is taxed in the same proportion as income from business stocks, making the net return to the investor a much lower figure than he can obtain from the investment of the same funds in municipal and state bonds that are exempt from all taxation. It is not difficult to understand why investors refuse to loan money on mortgage that gives a return limited in most sections by law to 6 per cent, when that income is materially reduced by taxation. On the other hand, the security that is back of well selected mortgages would make this type of investment specially attractive if for a limited time it were given the same preference in the taxation as enjoyed by state and municipal bonds.

No other remedy will be as effective in giving immediate aid. With a fair return assured from mortgages, building money will be plentiful. The demand for living accommodations is so great that building will be immediately stimulated, with the result that the supply will approach the demand and a tendency started toward reduction of rents.

The present condition is so acute and holds such peril to the welfare of the nation's workers, that this aid should be promptly extended by the Government. A theory of taxation is that no income should be free from contributing to the support of the Government, but the present exigency requires an adjustment of theory to meet practical requirements. The nation needs homes for its workers; there is now no prospect of their being supplied; the exemption from taxes on a limited amount of mortgage investments and for a limited period will greatly relieve the situation, and public opinion should be aroused to demand it.



20-year Barrett Specification Roof on Buildings of Union Stock Yards, Limited, Toronto, Canada. Architects, Union Stock Yards, Limited. General Contractors: Archibald & Holmes, Toronto, Canada. Roofers: The Maitland Roofing & Supply Company, McDermid Bros., Successors, Toronto, Canada.

100,000 Square Feet of Barrett Specification Roofs

The above photograph shows the mammoth new buildings of the Union Stock Yards, Ltd., Toronto, in process of construction.

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THE BARRETT COMPANY, Limited: Montreal Toronto Winnipeg Vancouver St. John, N.B. Halifax, N.S. Sydney, N.S.

Manufacturers' Catalogs and Business Announcements

CATALOG REVIEWS

The publications listed below have been recently prepared by building material and equipment manufacturers. Unless otherwise stated, copies can be obtained without charge by addressing the concerns direct at the addresses given.

ARCHITECTURAL AND BUILDING CODE SERVICE. NATIONAL LUMBER MANUFACTURERS' ASSOCIATION, Chicago, Ill.
"Building Ordinance" (5½ x 8 ins.). 62 pp. Cloth cover.

Since it became known that more than a thousand cities of 30,000 persons or less in the United States were without a code for the control of building activities, this little book was prepared to fill the need. This condensed form of ordinance is modeled upon those in use in our larger cities and opens with fire limits which are to be determined by local practitioners. This is followed by a section on permits, duties of inspectors, penalties for violations and definitions. Following this is found the regulation requirements, classes of construction, etc. A generous amount of space is given to equipment, fire prevention and an appendix of explanatory matter. The adaptability of this code to growing communities has been kept in mind by its compilers, and it should serve admirably as the nucleus of a more specific work.

THE CROWELL-LUNDORFF-LITTLE COMPANY, Cleveland, Ohio.
"Blue Book of Industrial Construction" (8½ x 11 ins.). 38 pp.

This pamphlet recently issued by the above organization is a graphic record of past performances and an index of the variety and quality of structures in which they are prepared to undertake erection. A corps of construction experts, familiar with the erection of industrial and mercantile buildings from the designs of architects and engineers, have standardized no less than twelve types covering the field from the clearstory and monitor foundry building to the sawtooth roof weave shed. These are shown by as many miniature blue prints and sketches by way of suggesting to prospective builders the nature of their requirements. A strong point is made to architects of this firm's ability to co-operate in the furnishing of industrial data and their facility to handle large construction projects.

ARMSTRONG CORK COMPANY, Lancaster, Pa.
Armstrong's Linoleum "Pattern Book — 1920" (3½ x 6 ins.). 176 pp.

The above handbook, containing the complete up-to-date line of patterns made by this company, is printed in color giving samples of the design contained in similar areas. Where architects are called upon to guide clients in the selection of floor coverings, this book, which is prepared for the benefit of linoleum sales departments, will be a help in showing color scheme, scale and appropriate patterns. Tile, parquetry, textile and other effects may here be closely compared in condensed form. There are 289 patterns, 90 of which are new this year.

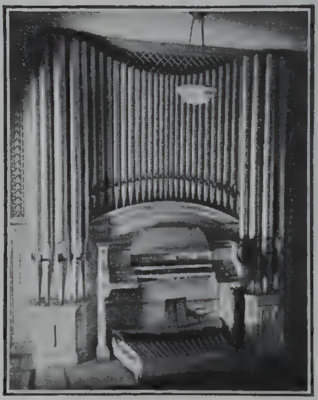
ANNOUNCEMENTS

Gordon Laidlaw Smith, architect, of Cincinnati, Ohio, recently returned from overseas service as a Lieutenant of Engineers, announces the opening of an office for the practice of architecture at 341 Volunteer State Life Building, Chattanooga, Tenn. Manufacturers' samples and catalogs requested.

Alfred C. Bossom, bank architect and engineer, announces the removal of his offices from 366 Fifth avenue to 680 Fifth avenue, New York, where he has made special provisions for his banking clients when they visit New York.

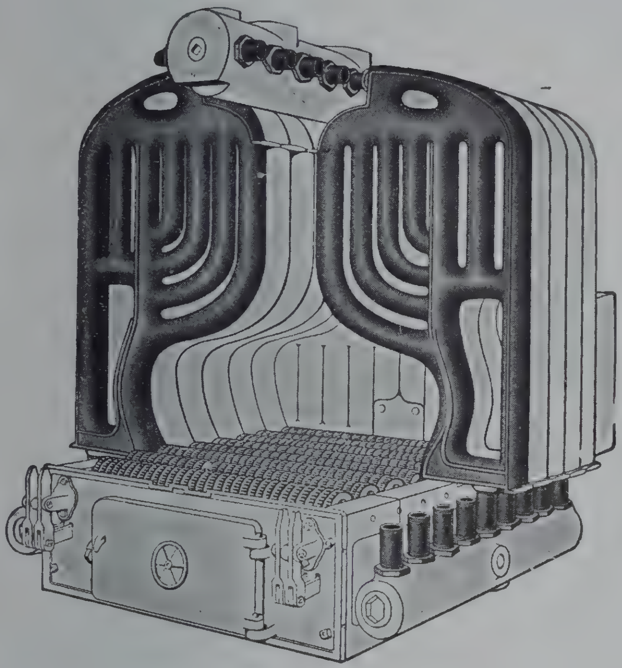
Frederick Meisler announces the opening of an office for the practice of architecture on Washington avenue, Little Ferry, N. J. Manufacturers' samples and catalogs requested.

Messrs. Keffer & Jones, Des Moines, Ia., announce the removal of their office to 204 Masonic Temple.



In the equipment of a building the heating plant tests the wisdom of the Architect and Owner as much as the structure itself. Investigation will prove the value, regardless of first cost of

Mills Water Tube Boilers



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THE ARCHITECTURAL FORUM

VOLUME XXXII NUMBER 2

CONTENTS for FEBRUARY 1920

PLATE ILLUSTRATIONS

LETTERPRESS

ALBERT J. MacDONALD, Editor

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THE EDITORS FORUM

EDUCATING THE PUBLIC IN THE APPRECIATION OF ARCHITECTURE

MEN in the profession who are giving serious thought to the development of architecture so that it may serve a wider field of usefulness in the upbuilding of our country realize that nothing is more important than cultivating a better knowledge of the art by the public. Architects can only exercise their talents through employment by the public, and if there exists only half knowledge or, what is worse, incorrect knowledge, of the profession and its work, the opportunities for advancing architecture are extremely limited. The joy that is to be had from appreciation of the beautiful must be made real to the layman, and this task devolves upon architects and artists who have the ability to express this great asset in clear terms that will be easily understood. It is no small undertaking, but neither are the results small that would emanate from the attempt, and they are worthy of any effort that will bring them about.

Mr. Kelsey, in an interesting paper in this issue, indicates the general sympathy of the heads of the larger educational institutions of the country that awaits a concerted movement in this direction. As he points out, this is only one medium for disseminating knowledge of the art of architecture; the work must be carried into the public schools where it will take root in the minds of children whose ideals are in the process of development.

Another source of knowledge is the popular press. A significant instance of the effectiveness of such means is the publication of an article prepared by D. Knickerbacker Boyd, architect of Philadelphia, in *The Ladies' Home Journal*, February, 1920. Mr. Boyd's paper is entitled, "The Duties of Your Architect." It is a clear and straightforward presentation of the subject to the lay person, and with the benefit of the wide circulation of *The Journal* it should prove of inestimable benefit to the entire profession. The greater part of this issue is given over to further articles relating to the various problems of home building; they are written by men who ably represent the profession, and the grouped treatment of the subject which is due in great part to Mr. Boyd's efforts constitutes perhaps the most comprehensive and intelligent information with respect to architecture and building that has been yet made available to a large body of lay readers.

Educational work of this character should have the active support of the American Institute of Architects. Scattered efforts of individual architects point the way and prove the possibilities. The need exists and is fast being recognized, there remains only the necessity for centralization of effort and persistency of purpose to secure great benefits to profession and public alike. As Mr. Pond has pointed out, the profession of architecture is a teaching profession as well as a constructing one. Let this important function be recognized, and the Institute as the national representative body assume its direction.

THE ARCHITECTURAL LEAGUE OF NEW YORK

THE annual exhibition of the Architectural League of New York is an event in the architectural world that is always awaited with interest by the country's architects because of the effective ingenuity its members display in the difficult art of interesting the general public in the work of the profession. It is, therefore, a matter of more than local regret that this year's exhibit suffered the misfortune of a serious fire on the opening day, January 30. The last exhibit, held in 1918, was promoted with the definite purpose of creating a larger appeal to the layman than to the professional man, and the architecture was shown in conjunction with the arts of sculpture and painting and the lesser decorative arts that combine to produce the completed residence or public structure that the layman sees. The success of the plan was immediate, and in this year's exhibit the idea was more fully developed and carried out through a series of specially designed and furnished interiors, each of which was under the supervision of an architectural firm. These interiors were concrete examples of the proper assembling of furnishings and minor decorative arts with architecture. They were, however, on public view for only a little over ten minutes, for a fire broke out in the main gallery of the Fine Arts Building in which the exhibit was arranged, and the entire contents of the gallery were consumed in a very short time. The architectural drawings, photographs and models comprising the usual architectural exhibit were in another gallery and 75 per cent of these were saved. The main exhibit, however, contained many mural paintings and pieces of sculpture that were the product of many months' work, and these, with many fine pieces of antique furniture, were destroyed, entailing an estimated loss of $750,000.

Notwithstanding this serious interruption in its routine, the League is now planning to hold an exhibit in the next few weeks. The fire has also hastened plans for the erection of a new building which will provide adequate exhibition space and opportunity for conducting the various art classes which the League sponsors.

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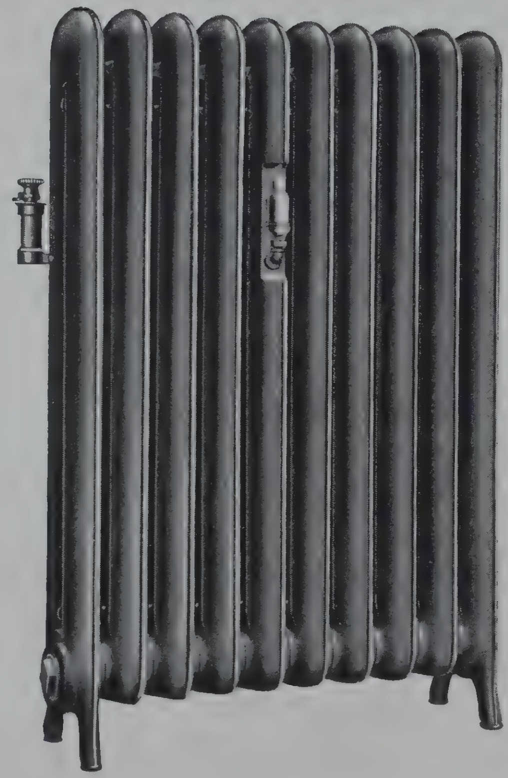

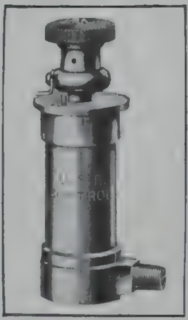

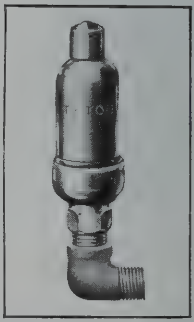

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The ARCHITECTURAL FORUM

VOLUME XXXII FEBRUARY 1920 NUMBER 2

Does Architecture Need a Salesman?

By EMERY STANFORD HALL, A.I.A.

DOES Architecture need a salesman? Note the term—"Architecture"—not the Architect. It must be borne in mind that there is an important distinction between the term "architecture" and the term used for identifying the profession which designates its members as architects. It is likewise essential that the terms be clearly defined. Architecture is the outgrowth of human need—the record of human desire. It is the manuscript by which we are able to read the souls that have lived and passed beyond. By it there are revealed the ideals, the aims, the aspirations of the peoples of the past. Architecture is the pen and ink and paper in the hands of the recording angel of the present. By it a knowledge of our civilization is made available for generations yet unborn. Is the motive of our action mean and narrow and selfish, or is it noble and liberal and magnanimous? It is alike recorded in enduring stone and fire-touched plastic clay. Architecture also is "the science and art of constructing and designing buildings"; the peculiar language of an age or people sometimes defined as "style of structure," but more properly defined as a style of human expression through material. In conclusion, then, is not architecture both the science and art of discovering, meeting and also the expressing of human need? Surely architecture is not mere material—such as brick and wood and stone—neither is it iron and glass, yet it is through the intelligent use of material that architecture performs its mission.

Does Architecture need a salesman? Let every preconceived notion be laid aside and let careful examination be made. Let there be no confusion of issue. The architectural welfare of the community is of far-reaching importance; it is vital to best existence. It is too essential to the paramount interests of the race to have its interest confused with those of a few little fellows who call themselves architects and use architectural practice as a means of livelihood. The world might dispense even with a Vitruvius or an Angelo; it has forgotten many of equal attainment; but the human world cannot dispense with Architectural Expression, neither can it dispense with the Science and Art of Building. For expression is an instinctive function of mankind. To deny expression to attainment would be almost equivalent to the destruction of ambition. Could there be faith or hope, certainly not love, without expression? While to build is only second in importance to the finding of food, it is essential to the preservation of food.

Does Architecture need a salesman? Is the salesman essential to public service? Can this medium be dispensed with? What is meant by the term "salesman"? Broadly stated, the term "salesman" has come to mean any medium of sale. Formerly the salesman was merely an advocate. His chief duty was to make sales—it was up to the house to hold customers. With him accuracy of statement was unimportant. It was up to the salesman to get orders signed; let the house take care of credits. What did it matter if the customer did buy goods unsuited to his trade, or that were useless for the purposes for which they were purchased? The salesman had made a sale and performed his full function. Ethics of salesmanship? Three words—"get the business." But now all of this is changed and a new philosophy has been worked out. To-day the accepted theory of the salesman's duty is quite different. To-day the good salesman searches for the consumer that would be benefited by a use of the wares of which he is charged with sale. He then proceeds to educate carefully the prospective customer to a sense of his real need, and in this campaign of education he bases his propaganda on provable facts. While the producer nominally pays the bill, the salesman's new code of ethics recognizes that in the last analysis it is, after all, the ultimate consumer that does and must pay all costs; and if the consumer pays the cost of salesmanship, then he is entitled to a kind of salesmanship which will give to him a corresponding return on his, the consumer's, investment. It will be seen, then, that from a useless camouflage the salesman has become a very important link in the chain of organized society. Specialization—that product of civiliza-

tion which has taught the individual that he can serve self-interest better and at the same time contribute most to the interests of the community in which he lives, if he will perfect himself in certain definite lines of endeavor — has increased the mutual dependence of individuals. The time was when the individual, or at least the family or tribe, was sufficient unto itself. In those primitive times salesmanship was not an important factor. Each individual was able to discover and solve his own needs. To-day such independence is impossible. Specialization has made individuals so interdependent as to make co-operation essential to existence. Corporate organization has assumed such an important place in present-day economy that corporate methods of handling business are coming to be universally adopted. In former days, sales were perfected through personal acquaintanceship and by general reputation. Modern processes of business have largely eliminated these methods, and to-day every organization of any consequence maintains its scientific purchasing department; likewise the determining factors in purchase are coming to be very generally understood to be cost and quality.

Does Architecture need a salesman? It is evident that society must find means of expression through architecture. It is equally evident that, under modern complex society organization, it is impossible for the individual himself to make that expression or to be informed as to where he may secure assistance in the promulgation of that expression. But the same law which has robbed the individual of the power adequately to express his needs, on account of his having concentrated his entire energy on a single line of special endeavor, has robbed him of the ability to seek out and find the assistance which he needs. He must, therefore, have recourse to the expert service of the salesman whose specialty is carrying information as to product from the producer to the consumer. Now if the public has become so dependent on the services of the salesman as to be unable to provide for its wants without the assistance of the salesman, then if the producer would reach the public, the producer must employ a salesman; and, further, if the product produced is of such character as to be essential to the welfare of the consumer, then it becomes a positive duty to present the product to the favorable consideration of the consumer.

Does Architecture need a salesman? Does society need architecture? Of course society needs architecture, and it needs it worse than ever before in the history of civilization. It needs architecture, and to have adequate architecture, it must make use of specialized individual service; but since it has no means to seek out and find that service, except through the medium of the salesman, it follows that the salesman must be provided, else will society suffer.

Does Architecture need a salesman? Yes, architecture needs a salesman, and it is the duty of architects to provide one. Will architects shirk a plain duty to their fellowman? Mr. Sidney Webb, in an address before the Royal Institute of British Architects, among other things, said, "I hope I am not saying anything too hard, but practically the brain-working professions began as the body servants of the rich, and they have not yet sufficiently realized that it is their duty to have developed out of that to become the servants of the community; they have not yet managed to make their service available for the whole of the community which needs their service." Mr. Webb's clear, succinct statement referring to the beginning and early practice of the professions is a most apt statement of the case as it applies to the early history of the practice of architecture; but it is likewise true, to a large extent, with reference to present-day practice. Architects have been slow, in common with members of other professions, to come to a full understanding of their duty to the community. This sloth, in the fullest appreciation of community obligation, while operating against the best interests of the community, has also tended to bring this and the other professions into disrepute. No single class of society can long disregard its plain duty to the community without suffering a lack of that public confidence which is so essential to the highest degree of efficiency in service.

Architects had the confidence and patronage of a considerable clientele which gave them a certain degree of material prosperity: a prosperity which befuddled their reasoning capacity to such an extent as to allow them to come to believe that they were secure in their aloofness from the common need. A false security which they are now beginning to realize through seeing much patronage towards which they had assumed proprietary rights going to others. How have architects acquired these notions, and what has brought about the change, can best be studied by an analysis of the development of Western civilization during the last century.

America has been passing through a more or less chaotic state. Society has not been well balanced; leveling influences have not been fully developed. There has been lack of perspective. These conditions have been fruitful ground for the development of dominant individualism. Enormous individual fortunes have been able to grow in a night. Many have suddenly found themselves

possessed of great wealth without the culture essential to its wise use. This lack of culture, on the part of the principal patrons of the professions, has operated against wise choice in the selection of professional assistance. It is not strange that a class which has acquired large wealth without a long, meritorious struggle would be inclined to judge their professional advisers by the same standards that had obtained in their own advance. Men without balancing culture, who had won wealth by sharp tricks or by chance, found no difficulty in convincing themselves that they were made of some superior sort of clay. It was so easy, why any one with brains could be rich, see what I have done; and the converse, any one that is not rich, or does not operate on a large scale, must be lacking in mental capacity. In face of these conditions the so-called professional man said, "What is the use?" "Bluff" is the word. In the presence of such ignorance, how could the architect be expected to obtain recognition of real merit in service? It was sure to be the architect who could show the largest and highest buildings; the biggest office force; and the richest clients who would be preferred with such a clientele. Technically meritorious performance and equipment did not enter into consideration. The rich man wanted an architect as smart as himself, and to determine this, looked to his, the architect's, seeming material prosperity, not to his technical worth. Now, of course, competent architects know that it requires less dexterity in practice to plan skilfully and supervise the erection of a stereotype skyscraper office building than it does to work out correctly the complicated and much involved details of many a building of very inferior magnitude; but neither the rich client nor the public understand this, and for that reason, while willing to pay largely for small service on a big project, were unwilling to pay even a living fee for large and very valuable service on small projects. This attitude on the part of the employing public has tended to divorce the architect from much service where the exercise of his best skill would be of inestimable public value. The factory and the housing problem demand the finest skill of the most diligent and perfectly trained architects; but since the simplest work pays the largest profit, and complex work of small magnitude pays little or no profit, the latter class of work is not sought by the salesman architect, and cannot be assumed by the professional architect, without serious peril to his economic existence. It may be observed that in the profession of medicine, the physician is able to make his rich patients pay the bills of the poor, and he is able to live on the average. In architectural practice the salesman architect secures all of the highly profitable business, and leaves the professional architect the complex and difficult middle magnitude work where there can be only a mere living fee with no surplus for the service of the poor. Therefore, the poor get no service, for the salesman architect neither has the disposition nor the ability to render such service, and the professional architect, despite willingness, because of economic limitations, is unable to render gratuitous service. Now the principles of economics make it perfectly clear that no service, no matter how desirable, can be rendered to the public without the public paying a living remuneration to those rendering that service, and since no remuneration for any sort of service can be secured from a democratically governed public, except that public is first convinced of the necessity and value of that service, and since it requires the medium of salesmanship to convince the public, then would it not seem that it is a public duty on the part of the architects to employ a salesman in order that the poor, as well as the rich, may have the gospel of the value of architectural service preached unto them?

Looking at this question from another angle: within the last few years material changes have come about in society structure. Socialistic propaganda is beginning to have its effect; the world war, through which we have just passed, was but an echo of these teachings. We say we have fought to make the world safe for democracy. "Down with the Kaiser," does not mean the elimination of the Prussian Royal Household or even of the Prussian Military System — it means, to a considerable extent, the death of dominant individualism and the preeminence of class or vocational socialism, not general socialism. The people are done with kings either of property or nations, and have found that by organizing themselves, so as to have control of an essential commodity, they can force wealth to its knees. Projects of magnitude will no longer depend for execution upon the will of the rich; but the small man, by joining himself with others, will be able to dictate the success or failure of almost any project. From a strictly selfish standpoint, therefore, it behooves the architect to curry favor with collective small folk. Now these small folk are too numerous to be cultivated in the same fashion as was so effective with the rich man. Trained in the school of adversity, these folk have learned to judge men on intrinsic worth. They want to know the possibilities of performance. They are being influenced less and less, as the years go by, by the flummery of social prestige and the glamour of tawdry display. What they want to know is what service they can secure that will be of greatest benefit to them. In place of selecting their

professional adviser through personal acquaintanceship, or even directly at all, they will have recourse to the use of some system of collective bargaining. An expert corporate purchasing agent or a collective buyer will be the medium of contract for service, and service will be rated on that person's idea of its economic value. Under these conditions only those who employ the services of the skilled salesman can hope to present adequately the value of professional service. Since no architect, who can show the highest degree of technical skill in his profession, can possibly be possessed of either time or sufficient skill as a salesman to present adequately his case to the expert purchasing agent representative of a class of collective bargainers, it becomes plainly evident that the architects must, eventually, make use of the expert salesman if they would preserve their identity as a class. For in case they do not make use of such salesman service to convincingly present their claims for consideration they must expect the function which they now perform to fall into the hands of other classes less fitted for that service, but classes which are now making the largest use of expert salesmanship, particularly the great contracting and engineering corporations, which are nothing more nor less than aggregations of brain workers who make use of highly perfected and unusually skilled sales organizations. With longer training and superior attainment, architects need not fear the competition of the so-called engineering and contracting corporation, provided they are willing to lay aside the dignity and prejudice which has grown out of the necessity of generations of individual patronage on the part of the rich and the powerful, and make use of modern sales methods. There should be no confusion in understanding. In no sense is it advocated that the architect himself should become a salesman. Either he would be a very poor salesman or a very poor architect; and since merit in commodity is essential to the exercise of the best skill in salesmanship, the architect must devote his entire energy to perfecting his technical skill in order that the salesman may have a good case to present.

Does Architecture need a salesman? If so, and it seems that the case is pretty well proved, how is this need going to be harmonized with the established ethical codes? Professional codes proscribe advertising in any form as unethical and prejudicial to the best interests of a profession; yet advertising is the handmaiden of the salesman, for commercial experience clearly demonstrates that honest educational advertising is an essential factor in salesmanship. Is it time, then, to do away with established codes, wipe the slate clean, and start over again? Is it expedient for the individual architect to employ advertising in laudation of his individual attainment? It hardly seems so — there were well founded reasons which led originally to the promulgation of the code. These reasons have not been eliminated. All professional service is personal service, and laudatory reference to it by the producer is equivalent to personal boasting, often rated as exaggerated egoism, and a practice which is always objectionable. Since it is difficult, if not impossible, to escape this objectionable feature in the presentation of the merits of the service of a single individual, it would appear that the only way open to the accomplishment of desired results is for the profession to present its merits to the public by the employment, through its professional societies and associations, of salesmen or organizations who will present the merits of architecture and the necessity of making use of the assistance of expert practitioners. This method of procedure will, no doubt, necessitate radical changes in architectural practice. Practice will need to be brought up to a uniformly high standard, for if individual merit is to be advocated collectively, then all of the individuals forming the collection must at least have attained minimum standards of qualification for service. The problem of adjusting to new conditions is necessarily complex. It cannot be undertaken hastily; it needs serious thought and constructive criticism.

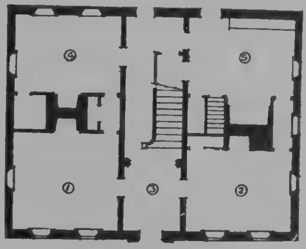
Conceding that good architecture is essential to the welfare of all, then the public must be made to know what is for their own good and by continuous reminding not allowed to forget. Recent events serve only to prove that it is not sufficient for the public to know its needs, but it must always have those needs forced to its observing attention. Witness the report of the Hughes' Committee on Soldiers' Benefit Insurance, a large percentage of the policies lapsing, not because of lack of funds to pay premiums, nor because of a lack of knowledge as to the value of insurance, but because the men were not continuously followed up and impressed with their duty, as in the case of private insurance where salesmen are paid premiums for keeping policies in force.

These observations force the conclusion that all architects should become members of local and state societies, and either directly or through affiliation with local societies, members and supporters of the American Institute of Architects, and this society should be provided with funds and institute a nation-wide educational campaign for the purpose of acquainting every one with the essential value of architectural service.

Early American Domestic Architecture

I. WENTWORTH-GARDNER HOUSE, PORTSMOUTH, N. H.

MEASURED DRAWINGS BY EDWIN J. HIPKISS

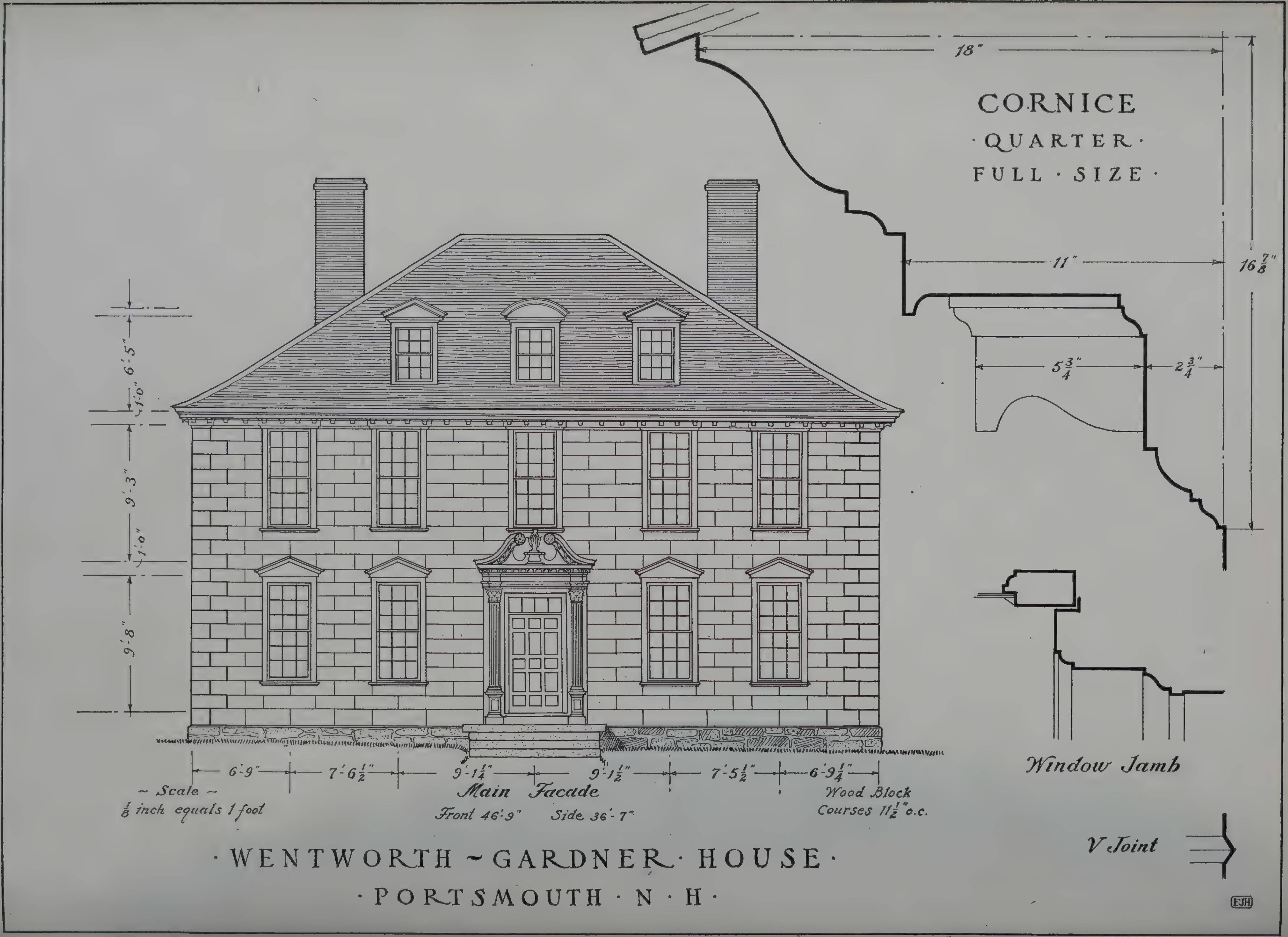


Main Floor Plan

THERE is much to be learned from a study of eighteenth-century American houses in which the exterior and interiors have been permitted to remain through the years substantially as they were designed. There was in all of them a marked consistency of treatment in the exterior design and the interiors which cannot be said to hold true in the work of our own day. This in some measure may be accounted for in that our idea of the Colonial style centers about details, with the result that we overlook the larger matter of general composition. Much of the data available is of fragmentary nature — details of many different buildings designed at different times — and in assembling them for use in modern structures the unity that is so typical of the original buildings is often lost. There is special interest, therefore, in such an example of the style as is illustrated herewith that provides an opportunity of examining the various parts of a single building, all dating back to the same period. It is also of value and interest in showing a reflection of the Georgian architecture of England from which our Colonial forms were devised.

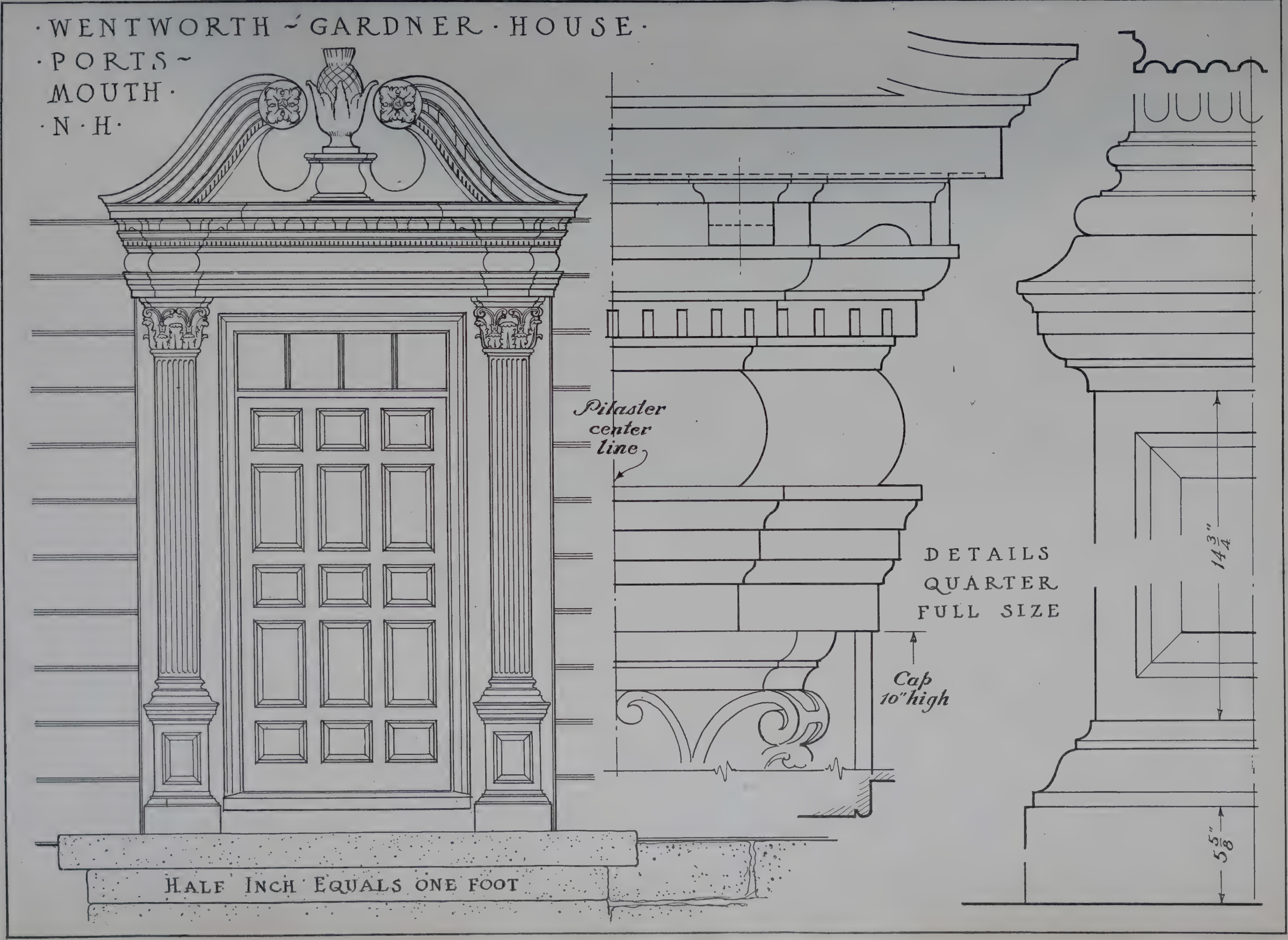
The house was built in the third quarter of the century and completed about 1761. The whole exterior is characterized by excellent fenestration and general proportion. Direct Georgian influence is seen in the windows, which are of the same size in both floors. The detail of the cornice and doorway is also typically Georgian in its vigorous proportions. The one outstanding feature of the façade is the fine scale observed among the different parts of the design.

The interiors are characterized by wood paneling in the Georgian spirit, differences of detail in cornices, pilasters and bases occurring in the different rooms. The second floor hall is a particularly impressive piece of design, the substantial proportions of the fluted pilasters and bold panels lending an air of great dignity to the room.



·WENTWORTH ~ GARDNER · HOUSE·

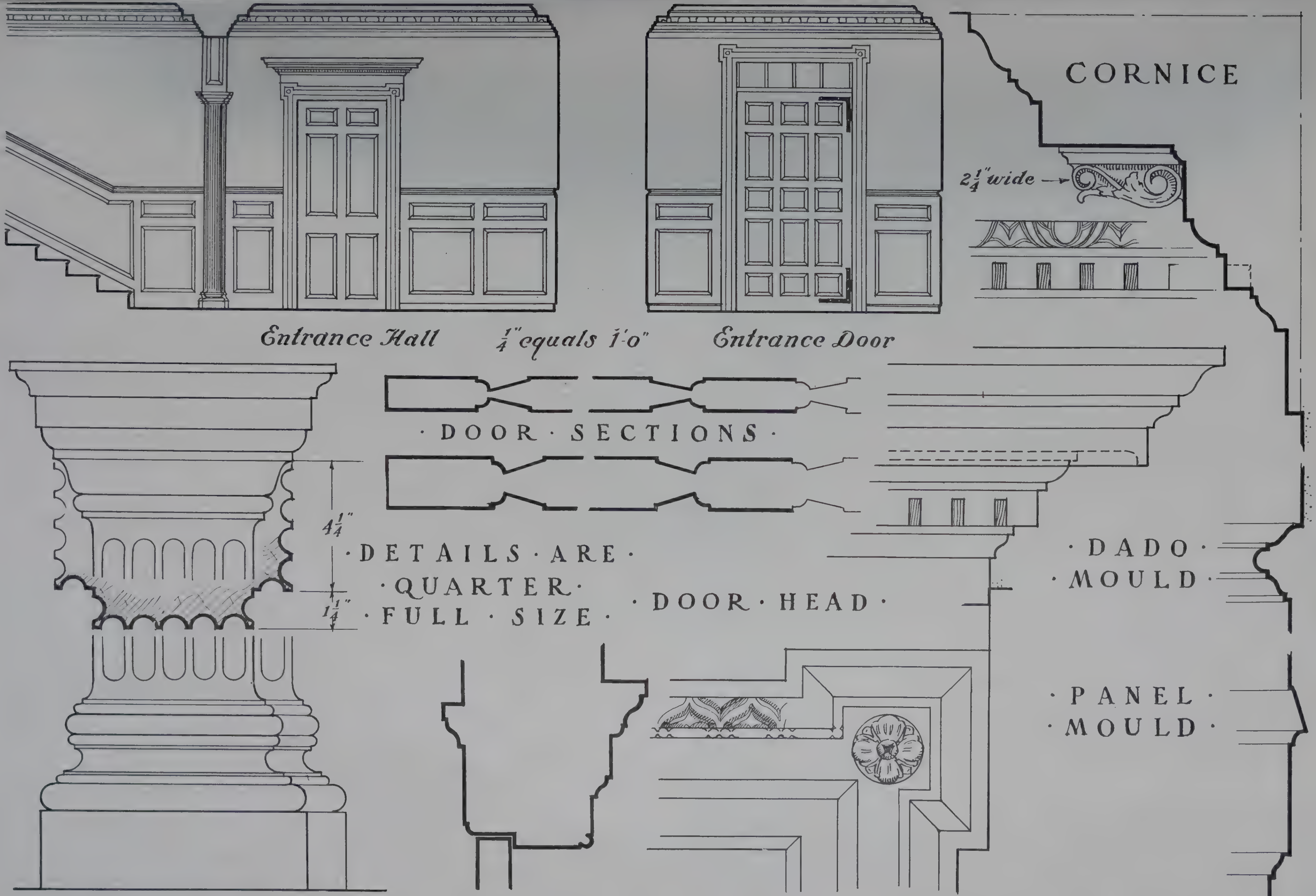
·PORTSMOUTH · N · H·


·WENTWORTH ~ GARDNER · HOUSE·
·PORTS~
MOUTH·
·N·H·
Pilaster center line
DETAILS QUARTER FULL SIZE
Cap 10" high
14 3/4"
5 5/8"
HALF INCH EQUALS ONE FOOT

DETAIL OF FIRST FLOOR HALL

DETAIL OF SECOND FLOOR HALL

WENTWORTH-GARDNER HOUSE, PORTSMOUTH, N. H.

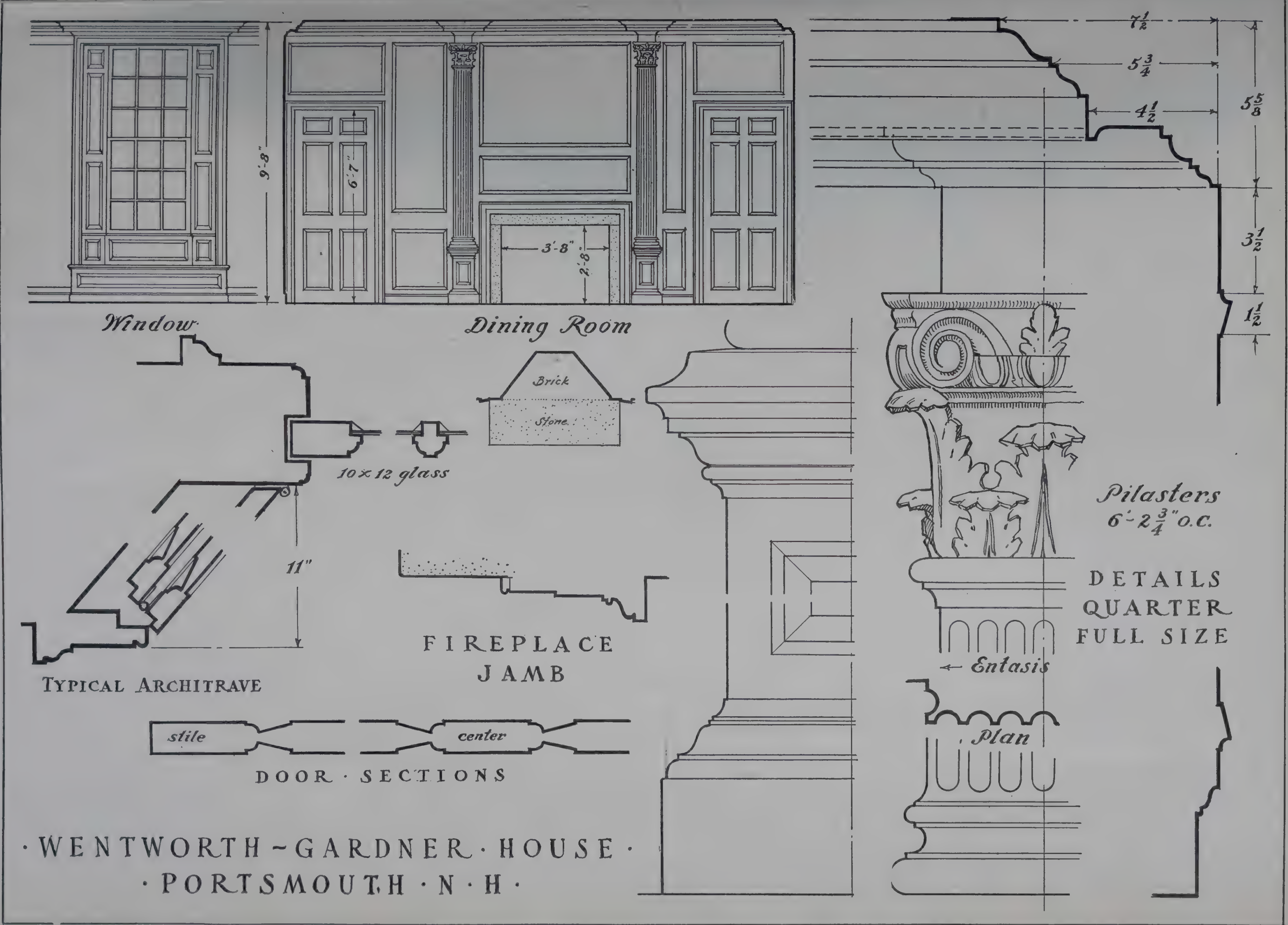


·WENTWORTH-GARDNER · HOUSE · PORTSMOUTH · N·H·

FIREPLACE SIDE OF DINING ROOM

FIREPLACE SIDE OF SOUTH PARLOR

WENTWORTH-GARDNER HOUSE, PORTSMOUTH, N. H.



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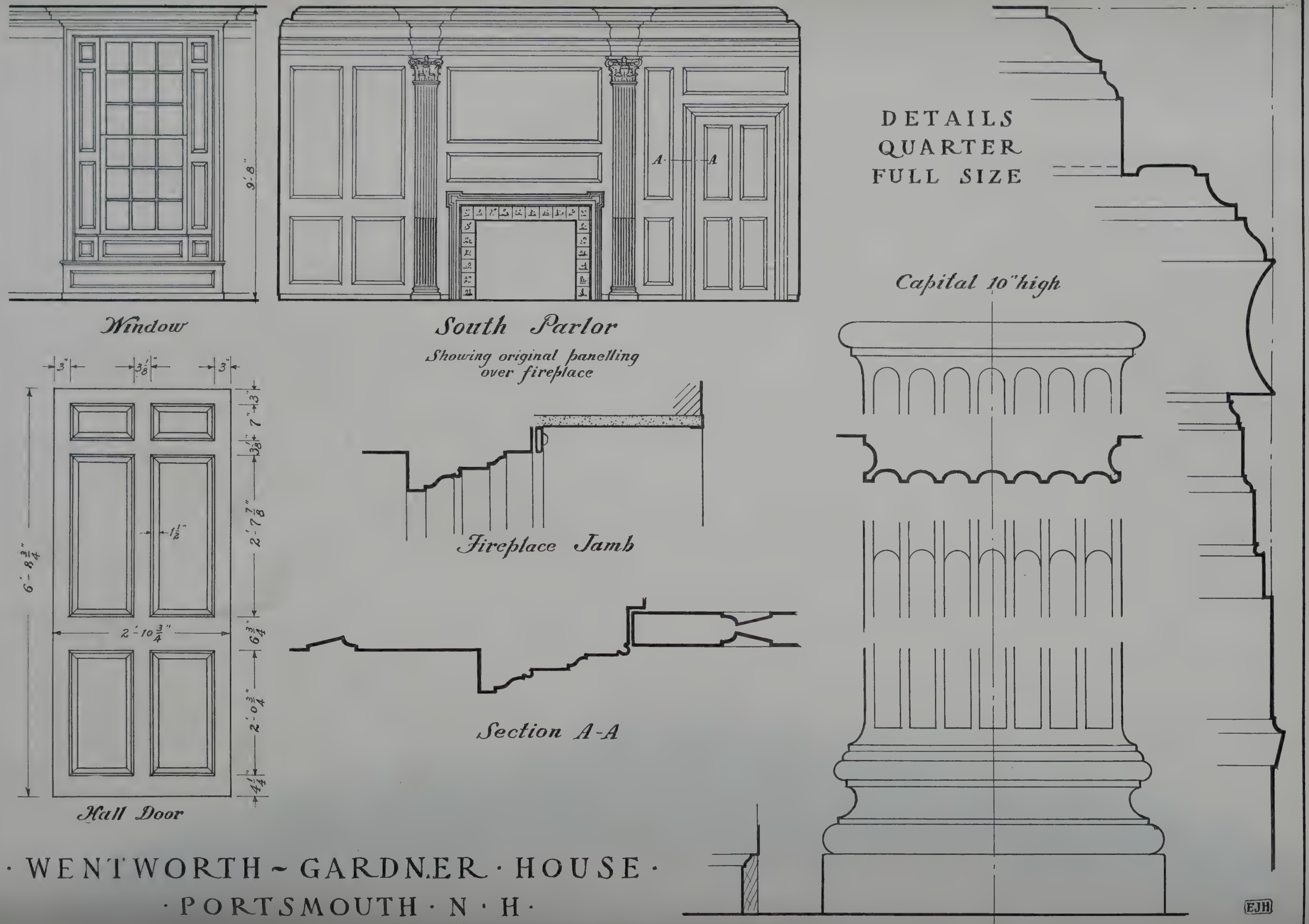


· WENTWORTH ~ GARDNER · HOUSE ·
· PORTSMOUTH · N · H ·

Notes from England

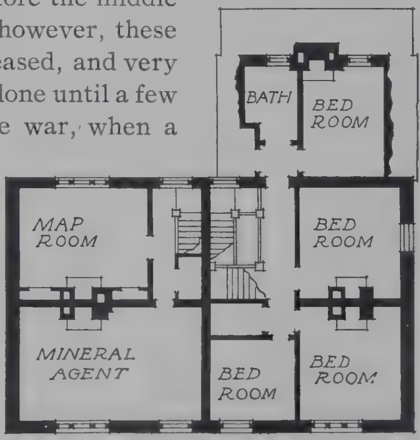
WITH SPECIAL REFERENCES TO THE WORK OF RICHARDSON & GILL, ARCHITECTS

By H. J. BIRNSTINGL, A.R.I.B.A.

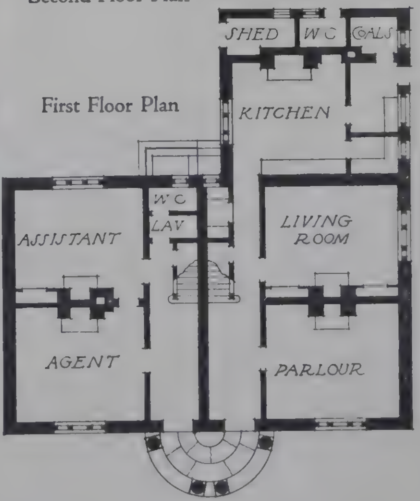
IN most offices there is to be heard an incessant rattle of tee-squares, as vast schemes are committed to paper, but as yet little has been projected into three dimensions. Nevertheless, a feverish activity pervades; volumes and portfolios are brought from their shelves, discolored with the dust of five years' accumulation; great tomes of Canina and of Bouchet, portfolios of Cesar Daly and of Famin and Grandjean — all is grist to the architect's mill. But the price of building is still rising, and no rift appears in the clouds which darken the architect's horizon. The vast government machinery, which is dealing with the housing of the working-classes, endeavoring by means of the 1919 Housing Act to make good a deficiency of half a million dwellings, moves forward ponderously, new difficulties and obstructions arising with exasperating persistency in its path. At present some ten thousand houses are in course of erection in England alone. A pause is made in all these labors upon the arrival of the mail from America, in order to examine the latest achievements from that great country, and sighs of admiration and envy are heard before work is resumed upon the heart-rending task of reducing the latest cottage cube, for the tenders have just been received and the lowest among them is £1,000.

From the various compact and local schemes which are being undertaken by the different local governing authorities under the new act, it is interesting to turn to the consideration of a large and extensive plan of development; such plans forming, as it were, a diversion from the garden city type of undertaking, of which so many are in existence to-day. In the west of England there is a large district — the property of H.R.H., the Prince of Wales — which has been undergoing a comprehensive course of reconstruction during the last few years. The development of the Duchy of Cornwall Estate, as it is called, dates back to the beginning of the nineteenth century, and one of the first buildings to be erected on it, in 1806, was the Dartmoor Prison, designed by Daniel Asher Alexander. During the ensuing years considerable development took place, the little hamlet of Princetown grew, and in 1813 the church was completed. Before the middle of the century, however, these activities had ceased, and very little more was done until a few years before the war, when a

New Duchy Offices, Liskeard, Cornwall, England
Richardson & Gill, Architects



Second Floor Plan



First Floor Plan

Portion of Garden Elevation

policy of reconstructing the farm buildings, cottages and tenements, and the erection of new groups of buildings in various districts on the Duchy of Cornwall Estate, was initiated. The architects appointed to carry out this important work were Messrs. Richardson & Gill.

It was the aim of the Duchy of Cornwall to preserve the distinctive architectural traditions peculiar to Devonshire and Cornwall for all the new work to be erected on the estate. The scope of prototype ranges, as has already been mentioned, over a period covering the late eighteenth and early nineteenth centuries, good examples of proportion and simplicity being found as late as the year 1830. The abundance of granite and the quality of the Delabole slating for roofing are determining factors in the design of such buildings. The Duchy offices at Liskeard are illustrated as typical of the pleasing effects that have been obtained in this work through extreme simplicity in design and the utmost economy of material. They contain two buildings,—the one comprising the administrative offices and the other a dwelling.

The work of Messrs. Richardson & Gill is by no means limited to housing developments. The firm is one which has attained to an important position in the profession with unusual speed, and its activities are manifold. Professor Richardson, although only thirty-nine years of age, has been a member of the Council of the Royal Institute of British Architects. He is, furthermore, professor of architecture at London University and the author of many well known books, as well as joint editor of *The Architects' Journal*. From his office is to emanate within the next few months one of the largest buildings of the decade. Tall and stately, designed in the Italian manner, it will rear its lofty head high above the turmoils of Westminster, and gaze serenely over St. James' Park towards Sir Aston Webb's remodeled Buckingham Palace. This is to be the new offices of the Underground Railways.

The most recent example of larger domestic work executed by Messrs. Richardson & Gill is a house at Sunningdale for General Sir Bruce Hamilton. "Hilltop," as it is so aptly

Entrance Hall at "Hilltop," Sunningdale, Berks, England
Richardson & Gill, Architects

THE GARDEN FRONT

THE ENTRANCE FRONT

"HILLTOP," THE HOUSE OF GENERAL SIR BRUCE HAMILTON, SUNNINGDALE, BERKS, ENGLAND

RICHARDSON & GILL, ARCHITECTS

Half Floor Plans and Front Elevation, Cottage Houses for the Manchester Corporation

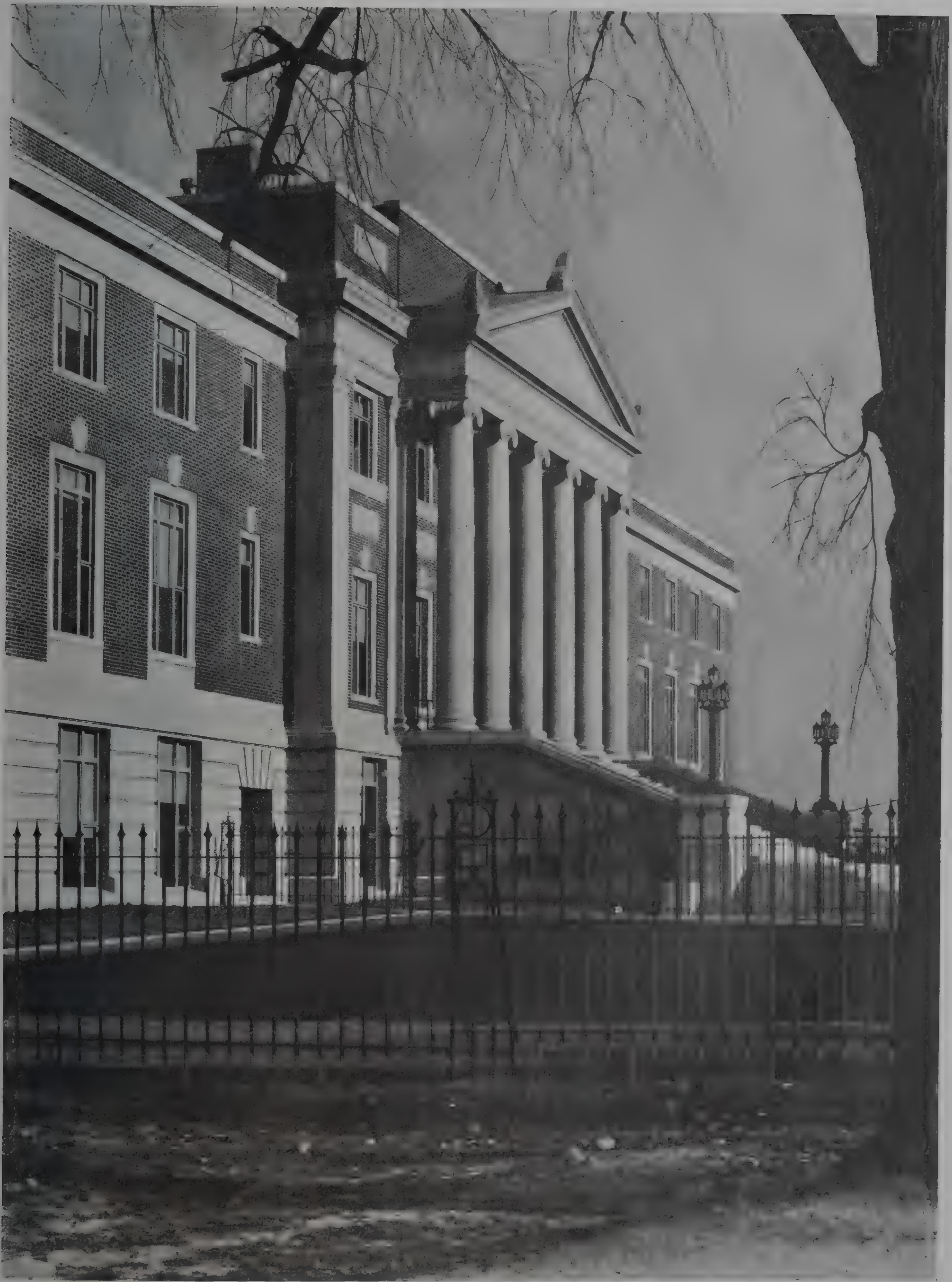
called on account of the eminent position which it occupies on the highest part of the famous Sunningdale Golf Links, is an example of a modern country house, designed to sympathize with the traditional Georgian manor houses of Berkshire. Reticent in design, yet all is found, upon close inspection, to possess the qualities and refinements which characterized that period. The grounds, formed on a site in the middle of the links, have been planned to sympathize with the lines of the house, and the garage takes the place of the traditional stable and coachhouses associated with buildings of this character. The house is compact in arrangement, the principal reception rooms facing south, a special feature being the servants' wing with kitchen, scullery and offices on the ground floor, above which are the servants' bedrooms. The staircase, from which indeed it may be said the whole house takes its tone, has an air of spaciousness and homeliness, and despite its unpretentious character it will be found, upon examination, to be satisfactory in every detail, no part receiving an undue emphasis which might disturb the subdued and dignified effect of the whole.

On all sides a return to these simple prototypes is to be found. There would appear to be a very real revulsion against the somewhat restless elevations which characterized much of the garden city work of ten years ago. To a large extent this early nineteenth-century revival is artificial, although it owes its inception to the work of certain younger men in the profession, who before the war were making their influence felt. There is, however, no doubt that the very high cost of building has given the movement a decided impetus. The necessity for designing cheaply has become imperative, and men are turning instinctively for what help they can find in the work around them; expensive roof-cutting, superfluous ornament, can no longer be afforded; picturesqueness which is dependent upon irregular massing and broken lines is soon discovered to be an item of expense, with which designers must dispense, and so the work of the Georgian period is being rediscovered. Here they may learn how dignity and beauty can be obtained without undue expenditure.

The cottages designed by Mr. Gordon Hemm, a Manchester architect, are typical solutions to the housing problem of the day. To those accustomed to the intricacies of the last few years such buildings may appear dull and devoid of interest, but to those who realize the charm of simplicity and the value of harmonious proportions, they cannot fail to make their appeal.

In order that there may be no opposition to new forms of construction which may tend to expedite housing, the Ministry of Health has formed a Standardization and Construction Committee, whose function it is to examine any new methods which may be put before it. Already many forms of concrete construction, both pre-cast and site moulded, have received official sanction, and under certain conditions, where adequate protection against fire is assured, timber houses may be built. In many parts of the country, experimental cottages are in process of erection.

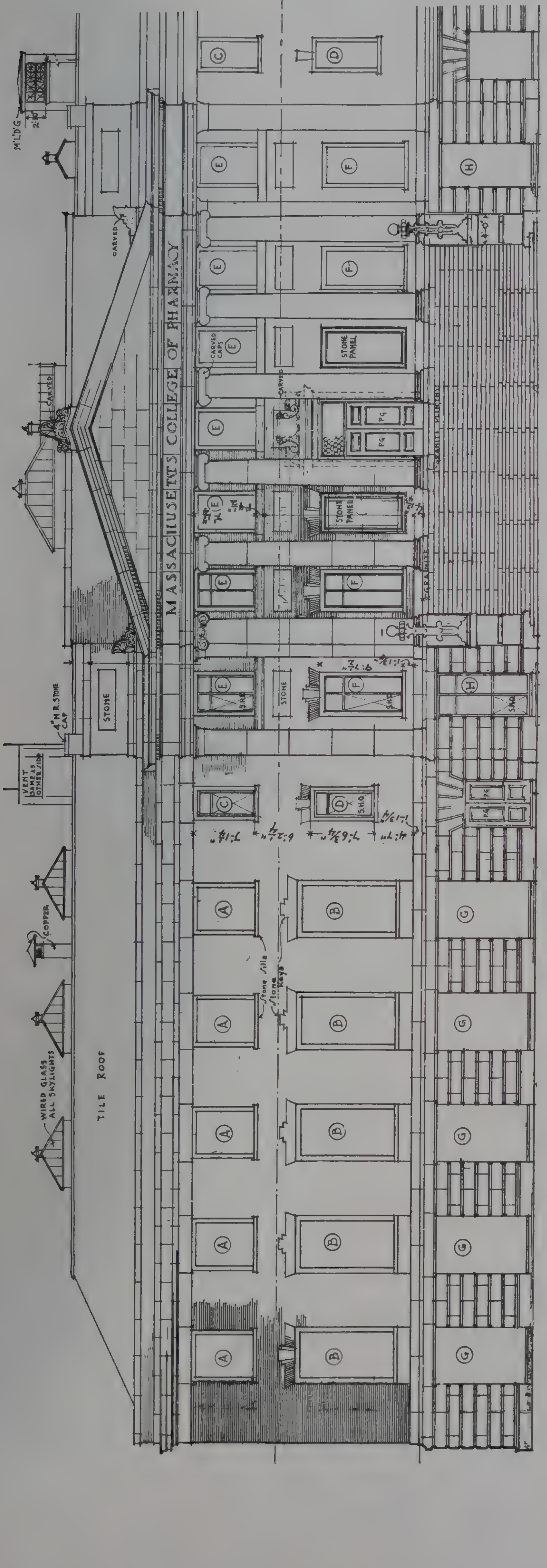
Half Floor Plans and Front Elevation, Cottage Houses for the Manchester Corporation
Gordon Hemm, Architect



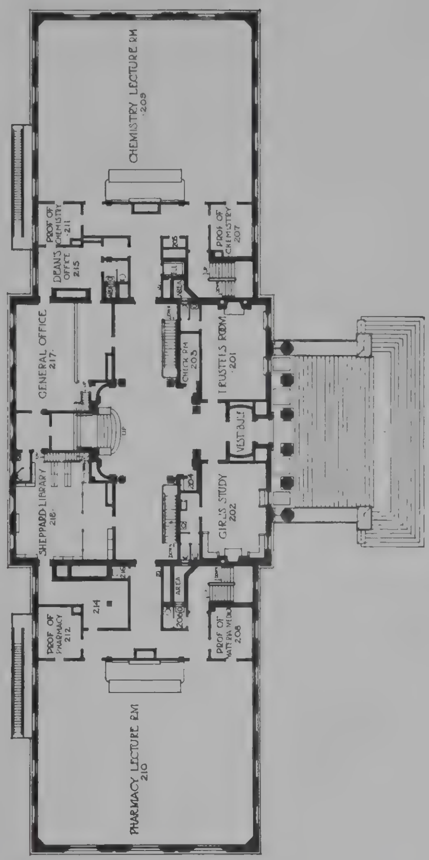
DETAIL OF ENTRANCE PORTICO

MASSACHUSETTS COLLEGE OF PHARMACY, BOSTON, MASS.

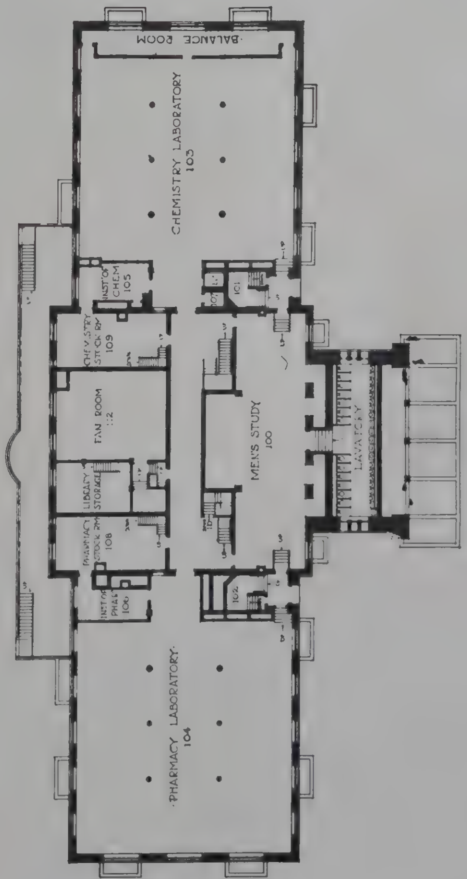
KILHAM & HOPKINS, ARCHITECTS



PRINCIPAL ELEVATION



FIRST FLOOR PLAN



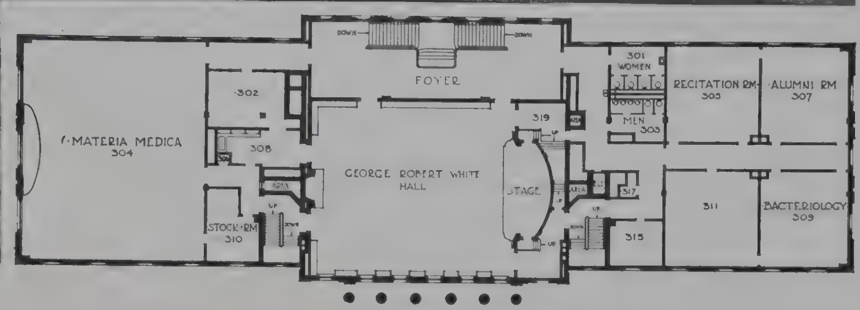
GROUND FLOOR PLAN

MASSACHUSETTS COLLEGE OF PHARMACY, BOSTON, MASS.

KILHAM & HOPKINS, ARCHITECTS

MASSACHUSETTS COLLEGE OF PHARMACY, BOSTON, MASS.

KILHAM & HOPKINS, ARCHITECTS



SECOND FLOOR PLAN

ENTRANCE HALL

STAIRWAY AND SECOND FLOOR HALL

MASSACHUSETTS COLLEGE OF PHARMACY, BOSTON, MASS.

KILHAM & HOPKINS, ARCHITECTS

DETAIL OF MAIN FACADE

AUDITORIUM LOOKING TOWARD STAGE

MASSACHUSETTS COLLEGE OF PHARMACY, BOSTON, MASS.

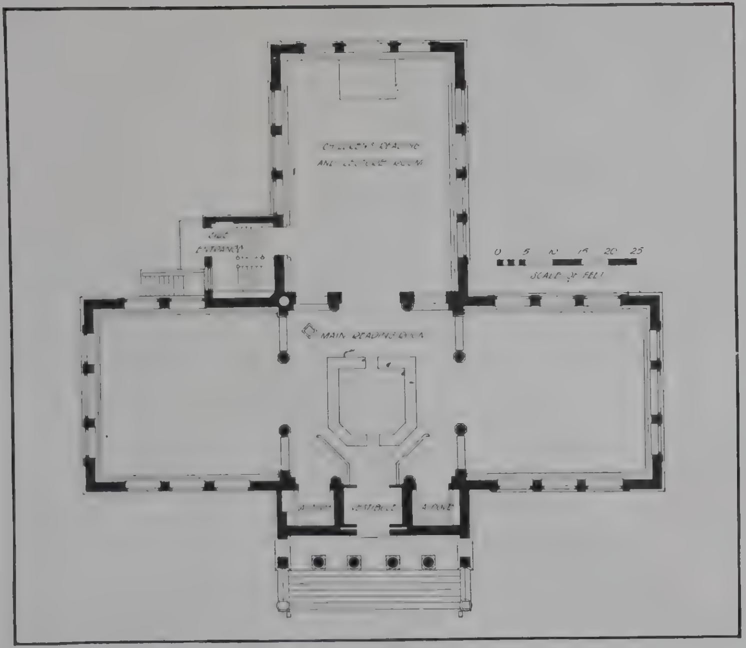
KILHAM & HOPKINS, ARCHITECTS

McPHERSON SQUARE BRANCH, FREE LIBRARY OF PHILADELPHIA, PHILADELPHIA, PA.

WILSON EYRE & McILVAINE, ARCHITECTS

VIEW OF REAR

DETAIL OF PORTICO

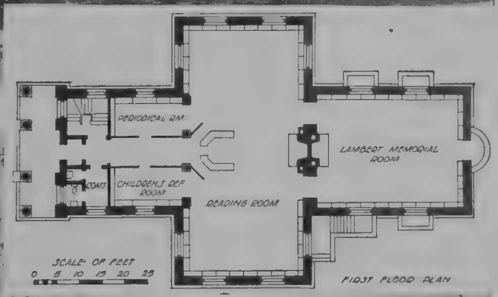


MAIN FLOOR PLAN

McPHERSON SQUARE BRANCH, FREE LIBRARY OF PHILADELPHIA, PHILADELPHIA, PA.

WILSON EYRE & McILVAINE, ARCHITECTS

DETAIL OF ENTRANCE PORTICO

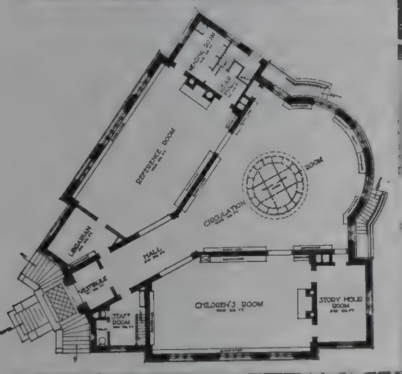


GENERAL EXTERIOR VIEW

ALTERATIONS AND ADDITIONS TO ABINGTON LIBRARY, JENKINTOWN, PA.

ZANTZINGER, BORIE & MEDARY, ARCHITECTS

GENERAL EXTERIOR VIEW



DETAILS OF ENTRANCE

GEORGE OSIUS BRANCH LIBRARY, DETROIT, MICH.

DONALDSON & MEIER, ARCHITECTS

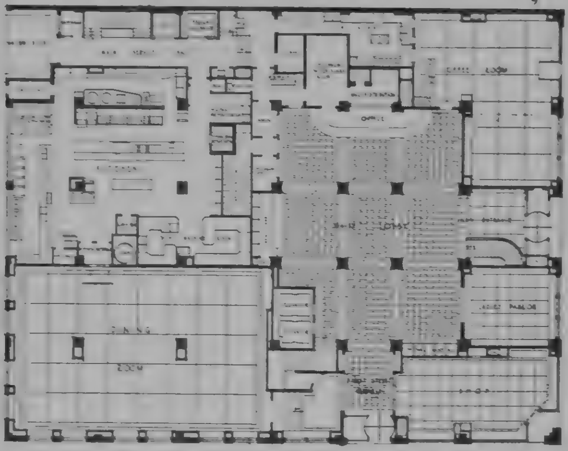
DETAIL OF ENTRANCE

GENERAL EXTERIOR VIEW

HOTEL FORT SHELBY, DETROIT, MICH.

RICHARD E. SCHMIDT, GARDEN & MARTIN, ARCHITECTS

TYPICAL FLOOR PLAN



FIRST FLOOR PLAN

ENTRANCE TO DINING ROOM FROM LOBBY

HOTEL FORT SHELBY, DETROIT, MICH.

RICHARD E. SCHMIDT, GARDEN & MARTIN, ARCHITECTS

SECOND FLOOR PLAN

BASEMENT FLOOR PLAN

MAIN DINING ROOM

VIEW IN LOBBY LOOKING TOWARD OFFICE

HOTEL FORT SHELBY, DETROIT, MICH.

RICHARD E. SCHMIDT, GARDEN & MARTIN, ARCHITECTS

FIRST FLOOR PLAN

SECOND FLOOR PLAN

HOUSE IN BROOKLYN, N. Y.

HOWARD MAJOR, ARCHITECT

ENTRANCE DETAIL

SUN ROOM

HOUSE IN BROOKLYN, N. Y.

HOWARD MAJOR, ARCHITECT

LIVING ROOM

DINING ROOM

HOUSE IN BROOKLYN, N. Y.

HOWARD MAJOR, ARCHITECT

DOORWAY FROM HALL TO LIVING ROOM

HALL DOORWAY AND STAIRCASE

HOUSE IN BROOKLYN, N. Y.

HOWARD MAJOR, ARCHITECT

The Next Step in Architectural Education

By ALBERT KELSEY, F.A.I.A.

THE excellent editorial in the November issue of THE ARCHITECTURAL FORUM on the public's lack of appreciation and understanding of architecture is most timely. I, too, attended the Nashville Convention where this topic was discussed and am therefore delighted to see revived that discussion laying stress on the fact that our universities and colleges give so little attention to the teaching of the fine arts, with the result that the average graduate is no better qualified to serve on a building committee or a town-planning commission than any other free-born, happy-go-lucky, half baked American, rejoicing in the conviction that he can dive deeper and come up drier than any other man on earth.

Deeply appreciative of the sincere and ardent work being done by the professors of architecture in our thirty-eight universities and colleges where architecture is now regularly taught (but virtually only to future architects), on May 5, 1917, in my capacity as President of the Pennsylvania State Association of Architects, I addressed a circular letter to the heads of those thirty-eight seats of learning to try and ascertain if they regarded their own architectural department as anything more than a school in which to teach boys a way to make a useful living — in short, if they considered it a superior department or only in the same category with schools of engineering, domestic economy, dentistry, veterinary surgery, etc., it being my desire to ascertain how many really regarded it as a cultural department destined to exercise through its graduates and their work an uplifting, broadening and refining influence upon our people throughout the nation.

The five questions asked were in brief as follows:

1. Can not a way be found to call the attention of students, in all departments, to the fact that the practical art of architecture concerns them one and all?

2. Has your university ever bestowed honorary degrees upon an architect, town-planner or writer on art?

3. What ways can you suggest of spreading knowledge and appreciation of architecture?

4. Is there a need for art, for taste, for artistic discrimination, in the United States?

5. What is the average degree of art knowledge and appreciation among your own students?

Only two or three of the thirty-one replies from twenty-eight institutions were categorical answers, and indeed most of them dealt only with my letter in a general way, but all but one were appreciative, and many keenly so. Unfortunately, they were not, however, all from the presidents themselves, some having been referred to the heads of the schools of architecture whose opinions, of course, were well known. On the other hand, from Princeton, Columbia and the University of Kansas I received two replies and, in that my inquiry covered thirty-eight institutions and not merely the twelve composing the Association of Collegiate Schools of Architecture, the composite of these replies may be assumed to represent the feeling of the heads of representative and not exclusive institutions of learning where architecture is taught; and conversely, it may be safely assumed that less appreciation is felt in those institutions where architecture is not taught at all. In support of which, allow me to state that just a year before I held my symposium, Professor Holmes Smith of Washington University prepared a report on art instruction in universities and colleges of the United States in which he showed that out of the one hundred and forty-nine institutions his committee had investigated, only 7⁷⁄₁₀ per cent of 221,442 undergraduates enrolled in these universities and colleges in 1914–15 received any art instruction whatever, while fifty-two of them offered no art for students to ignore! And here I might digress again to quote from Mr. R. Clipston Sturgis' report, made the following year, as Chairman of the Committee on Education of the American Institute of Architects, when he said: "As long, however, as colleges disregard the place the arts occupy in history, so long will preparatory schools be forced to omit teaching anything connected with art."

But I must return to the replies I received. President Nicholas Murray Butler of Columbia wrote that he was referring my letter to the Provost for detailed reply, stating himself, however: "I would say that we have in recent years conferred honorary degrees upon such men as the following, all of whom are associated in the public mind with the development in America of the fine arts, and some of whom are well-known artists: Charles Eliot Norton, Charles F. McKim, George B. Post, Edwin Robinson, Daniel C. French, Edward H. Blashfield." Dr. William H. Carpenter, the Provost, said among other things: "The suggestion which you make of having a professor of architecture lecture before the entire student body is one that I am thoroughly confident would be worth while and should be put into practice when it is possible for us to care for it financially;" and, again, "There is indeed a need for art, for taste

and artistic discrimination in the United States to-day. We have, I think, as a University this fact constantly in mind, and we are only too ready, willing and waiting to grasp every available opportunity that presents itself for an extension of influence upon our part in these directions," and once again: "Art is still to the American mind in general a book of seven seals that has yet to be opened to the public comprehension. Your letter has greatly interested me as an administrative officer of the University, and its suggestions directly and between the lines are greatly appreciated." President Hibben of Princeton is represented by replies from Dean West of the Graduate School and Professor Howard Crosby Butler. "Whether a lack of good taste is inherent in democratic peoples is a two edged question," wrote Dean West. "It was not a fact in democratic Athens. It is a fact in imperialistic Berlin. And, despite the marked recent improvement, beginning about 1880, it is an appalling fact in our own land. It is something of a mystery that it should be so, for Colonial America was a home of quiet taste. How did we ever lose it? I think, in part, from the vulgarization that set in with the advent of quick and economical production through machinery, making it cheaper to put up buildings that lacked the direct human touch in their making. Whatever the reason, the fact remains that most of our domestic and public architecture is unlovely." And further on: "Let architects of taste have some sort of public censorship over the design of all buildings to be erected. Let instruction in drawing and the simplest method of design be made obligatory in all schools. Let large permanent photographs of the finest historic buildings be in daily sight on the walls of every school. Let the art museums be multiplied and exhibit to every community casts and pictures of the best examples of art. Cultivate in teaching the power of *seeing* things. Too few use their eyes well. Let the universities provide thorough courses in the history of art, so that we may have a larger supply of architects who really know what is pure architectural style in each kind. Once the movement really starts, it will make great headway, for in America especially the process of public contagion is swift. But underneath it all is needed education in quiet, modest self-respect and in love of the things that make life noble. Whenever this happens, good taste will be the natural and almost unconscious result." Professor Butler's long and enthusiastic letter described the plan for the establishment of the school of architecture which would have been in operation now but for the interference of the war; in part, he said: "But the teaching of the history and appreciation of architecture is no new subject at Princeton, having held a prominent place in the curriculum, in the department of art and archæology, for upwards of twenty-five years." And again: "Out of a class of seventy-six in junior architecture last year only twelve were intending to study architecture as a profession." And here is something significant: "I may add that by general consent of the students themselves, even of those not electing art courses, our department draws the best all-around men in each class of about three hundred and fifty." And once more from his letter: "If the colleges are to undertake the task of creating a broad, general knowledge of art, and of making the homes for the rising generation centers of art appreciation, some means must be devised whereby a larger number, or all, of the students, at some time in the course of their college careers, shall be brought into contact with the teachers of art subjects." "I fully and entirely appreciate the value of architecture," wrote President Lowell of Harvard, "and have devoted some of my own time to amateur study of it. Harvard has conferred honorary degrees on architects and artists; has for more than a generation made fine arts one of its subjects of study, and at present has a number of courses in architecture for its undergraduates in college, given by the dean of the school of architecture." James R. Day, Chancellor of Syracuse University, wrote: "Your letter of May 11 interests me exceedingly. I agree with you when you say that our colleges and universities have a responsibility in promoting the development of good architecture in this country and that this can be accomplished by a general movement for a broader spreading of the significance and value of architecture. You ask how this could be done. Some of the ways which occur to me are, by publicity in the daily press and magazines, in articles written for the popular understanding, by lectures and traveling exhibitions of architectural work given and planned by competent men of the profession. Syracuse University will be glad to support such a movement to the extent of its ability."

Dr. Schurman, President of Cornell University, ended his letter as follows: "As regards the other points of your letter, I share your view that art has not yet found its just place in the scheme of education of our people. The most important thing to be done at the present stage, I think, is to instruct public opinion concerning this deficiency, and to seek in every way legitimate ways to awaken and develop healthy interest in art." He enclosed a prospectus from which I quote: "Of the fine arts — music, painting, sculpture, architecture — it is architecture which has been longest established at the University and has had the fullest

development." From Francis P. Smith, Professor of Architecture in the Georgia School of Technology: "In an engineering school such as this I think it is rare that you will find a student (other than one in the architectural department) giving any time, thought or attention to artistic matters." President S. M. Newman of Howard University, Washington, D. C.: "You will readily see that there is no attention paid here to art in any one of the forms of its manifestations in connection with courses of study. Of course I thoroughly believe that education is not complete until it has a development upon the whole side of life." Dr. Benjamin Ide Wheeler, of the University of California, found "much to sympathize in regarding the interests of the art of architecture;" and after reviewing the ignorance and indifference of the public said: "I am afraid the political architect is doing the profession just at the present time a good deal of damage. It is all the more necessary that those who are idealists should assert themselves," etc. And then he concludes, "Particularly mischievous is that member of a firm, and such a member generally exists, who is recognized as a good 'business-getter.'" Dr. Edwin E. Sharp, President of State College, Pa., wrote: "I imagine that the ratio of one to ten is about the way art stands to industrialism in this material age. We are trying to do what we can in our college, which is largely devoted to technical instruction, but we find it difficult to persuade students that there is anything more in life than a 'job.'" Dr. George E. Vincent, then President of the University of Minnesota, wrote: "I think universities like Minnesota can, through their extension divisions, accomplish a good deal in the way of popular education in architecture. If sets of slides could be prepared under the auspices of your Institute, I believe a good many universities would gladly purchase these slides, together with lecture notes that might accompany them. There can be, I think, no question about the need for higher æsthetic education of the people in the United States. I fear that the fine arts are much neglected everywhere. We at Minnesota cannot pride ourselves upon any marked variation from the prevalent apathy," etc. "If I were not leaving Minnesota, I could give you personal assurances that I should do all in my power to foster the art interests of the University community." Prof. J. T. Willard, of Kansas State Agricultural College, wrote: "There is doubtless very little appreciation of art in the United States, but I believe that our students are led to give more attention to this matter than they would had they not been here. Doubtless issuance of bulletins through the Agricultural Experiment Stations of the country would bring some architectural knowledge to the rural regions where it is sadly needed." A. S. Langsdorf, Dean of Washington University, St. Louis, Mo., wrote: "The beautiful buildings of Washington University have had a very great effect in raising the standard of appreciation of architecture in this vicinity, this influence being very clearly seen when one examines many of the public school buildings, churches and other public structures. I am sure that so far as our own students are concerned, the silent influence exerted by our beautiful surroundings is very potent." Professor Biggin, of the Alabama Polytechnic Institute, wrote: "Dr. Thatch wishes me to tell you that it is the policy of the college to make the work of the department of architecture count largely with the student body, and that the professor in charge has been accustomed to give certain public lectures as you suggest. When possible, outside lecturers are also obtained for this purpose." Prof. Francis W. Kerrick, of University of Notre Dame, Indiana, wrote: "I can find no record of a degree being conferred upon an art worker. This is depressing enough," etc. "In 1883 the Lætare Medal was given to Patrick Keely, an architect of some six hundred churches, and later to Miss Eliza Allen Starr, a lecturer and writer upon Christian art."

These replies, including the naïveté in the last one, are encouraging; but in the light of popular education in general they merely record the fact that architectural education for architects is years and years ahead of the public, and that there is at last, happily, an implied desire in some of the universities to help educate the public.

But it is neither just nor desirable that the cultivation of a larger appreciation of architecture should be left to the higher seats of learning.

Architecture is a universal subject touching life at too many points for that, therefore let us examine some of the other contacts and speculate upon what might be done through other sources.

The moving picture industry, now the fourth in importance in the nation, is a mighty power for good or evil. It reaches all classes everywhere, spreading new ideas and arousing fresh enthusiasms. What a teacher of architecture this universal medium might become if real architecture were used for the backgrounds and surroundings of its dramas instead of the spurious Universal City scenery! But popular lecturers like Burton Holmes and Elmendorf, however, do show pictures of the real thing — of the most beautiful specimens from all parts of the world, and they, moreover, each have a vast following among the most thoughtful people. Why not aid them a little with their descriptions? And again why should not the

Institute recognize them as it has the professors?

While the field of architectural journalism is covered better here than in any other country, the Journal of the Institute itself, especially through its illustrations, might do much more than it is doing. True, it has to its credit, through the energy and prescience of its accomplished editor, Mr. Whitaker, two educational campaigns of the most far-reaching significance, — one on government buildings and the other on housing.

Mr. Zantzinger, the present chairman of the Institute's Committee on Education, desires that the Institute shall become a member of the American Council on Education, and likewise is endeavoring to bring about ways and means for the publication of a text book on the appreciation of architecture for use in colleges and by the public, to be more or less under the ægis of the Institute — both excellent ideas. And furthermore he has wisely reorganized his committee to insure continuity of effort; it is now a committee of nine, three elected each year, with sub-committees on Architectural Education, General Education and Public Appreciation of the Arts.

Then the Episcopal, the Methodist and the Lutheran churches already have adopted plans whereby the designs for all their new churches are to be passed upon by competent committees of architects. What a field the church offers for propaganda! Of all the professions outside of architecture itself, that of the clergy is the most interested and best trained to spread the gospel of good architecture.

But bigger than any idea I have yet touched upon is the idea that came out of the Middle West when Mr. Thomas Kimball became President of the Institute. He realized that a new social order would have to be evolved in the wake of the war, and thereupon determined that the architect should do his proper part in bringing about this evolution. He realized that the problems of society, the reconstruction of the old order, would have to be faced; that the physical development of towns and cities would have to be studied along purely social lines, and lines, moreover, entirely in consonance with the spirit of true democracy. Thus he made it his policy to try and develop a system whereby both architects and architecture shall become indispensable members of the social fabric and not luxuries or exotics as we and our work are often regarded. What this Post-War Committee may bring about of course is problematical, but in that it has already brought about the holding of a successful national Inter-Professional Congress where professional men from fourteen professions came together from many parts of the country to discuss this vital question of the new social order and of a new kind of leadership, which shall be neither plutocratic, political nor bolshevist; but a leadership of brains and high ideals seems to indicate that a more widespread influence and a greater sphere of activity is opening up to the profession of architecture. At any rate, it is the kind of educational work that is most needed at the present time; while under the constant leadership of professional minds the imagination of our people may yet become inflamed and be turned from the sordid, matter-of-fact things of industrialism to a contemplation of the sublime.

Through the Rotary and Kiwanis Clubs of the country much may be done; for some day "the plain business man" is going to wake up to the fact that he can neither afford to live nor do business in vulgar, sordid surroundings. He is going to learn that his motto, "He profits most who serves best," means something far beyond industrialism.

But Dean West hit the nail on the head when he said, "Cultivate in teaching the power of seeing things;" that is the crux of it all. Until bad architecture looks ugly and offends, few will care. Therefore, the writer believes that the next step in architectural education must be through the public schools, and that it may easily be made a light and a gay step along the road to happiness. Unfortunately the college boy is too old to learn to use his eyes to the fullest advantage, coming as he does, for the most part, from homes where there is neither artistic appreciation nor artistic curiosity. His ideas are already formed along grosser lines; he cannot get the same happiness out of beauty that the child can; and therefore, I think, that the work should be started among little children, who with fresh, eager, undimmed and unprejudiced eyes may be trained instinctively to see and enjoy the beautiful in everything. Of course it must be continued in the colleges, and if magnetic teachers — men and women of imagination and force — continue this work — teachers thus endowed, which is only another way of saying teachers wearing Tyltyl's magic cap set with the wonderful diamond "which gives new light to dimmed eyes," the soul of things will at once become apparent.

In conclusion, considering the problem in the largest sense, it seems to me, that what has to be taught everywhere, in some way or other, is the joy that is to be found in the soul of things, while it must be made very clear indeed that the most precious diamonds are not to be found in the sordid dunghill of industrialism, glossed over as it often is with its varnish of art pretense; but, happily, that they may be found, not singly but in abundance, by any one who has "the seeing eye" and a genuine understanding of the good, the true and the beautiful.

The Kitchenette Apartment

II. SERVICE FEATURES AND EQUIPMENT

By CARL A. ERIKSON

IN the dining-kitchen, we revert to type; eating in the kitchen! but a kitchen our mothers, or grandmothers, would hardly recognize. We have marveled at the ingenuity shown in the Pullman dining car-kitchens and here we have it condensed for home consumption. No longer acres of "clear white maple" to scrub; no longer endless steps from pantry to kitchen to dining room, and no wonder the "help-less" modern wife greets these miniature kitchens with shrieks of delight. One step, possibly two, will bring anything in the larder on to the stove, two steps will return it, two more steps will put it on the dining table. An agile, long limbed woman might get the entire meal without moving — merely reaching and turning. On one side is the sink; on the other, the range and the kitchen cabinet; across the end is the refrigerator and a case. Above the refrigerator there are usually three compartments: one for garbage, one for milk, etc., and a third for parcels, groceries, etc. These compartments as well as the ice chambers of the refrigerators have a door opening into the service closet. In the higher class apartments, packages, milk, groceries, etc., are delivered to a clerk in the receiving room and at regular intervals distributed throughout the building. Only the hotel staff have keys to corridor doors of the service closets. Losses through theft are thus reduced to a minimum, and yet packages may be delivered without disturbing the tenants and regardless of whether or not they are in. In some hotels, packages, milk, etc., are not delivered, but the tenant must call for them at the receiving clerk's desk. In others (the ordinary construction) this is handled as in the ordinary apartment house by the tradesmen delivering at the door. Many ingenious contrivances have been developed for the safekeeping of these parcels during the absence of the tenant. The refrigerators are sometimes mechanically cooled. Whether the small units to be cooled justifies the expense of installation and operation, is questionable. Ordinarily ice, whether purchased or manufactured, is placed in the refrigerator from the service closet.

Waxed paper bags are furnished the tenant into which he places the garbage. This is then placed in a receptacle above the refrigerator from which it is removed through the service closet at regular intervals by the janitor. An opening is provided into the sanitary garbage chute at each floor. It

Fig. 8 End Views of Dining-Kitchenette, the Surf Apartment Hotel, Chicago, Ill. Fig. 9

J. A. Armstrong, Architect

drops through this large sewer tile into a furnace in the basement and is burned, the chute then forming the smoke flue. This may seem to be an unsanitary makeshift arrangement, but it has proven very satisfactory. It is the only form of garbage chute, permitted by the Chicago Health and Building Departments. The manufacturers (it is patented) claim that no odors will be noticeable as there is such excellent draft in the flue, and that the heated gases passing upwards when the fires are started destroy any refuse that may have been deposited on the sides. The Chicago Health Department is evidently convinced. It may seem unpleasant to have the garbage hauled through the main corridors of the building, but this objection is probably more theoretical then practical. It needn't be any more so, than, say, the removal of rubbish and sweepings from the room. In some newer buildings it has been planned to provide these chutes for each kitchenette. This expense is probably unwarranted. The chute disposes of the garbage on the floor on which it is collected and saves the time of the janitors. It is possible to use large cans for its collection and carry them down the freight elevator and burn in the usual type of garbage burner. This, as it multiplies the length of time the garbage stands around, increases the difficulties of its cleanly disposal. The small gas incinerators in each kitchen would probably not be warranted because of the cost of operation and of installation.

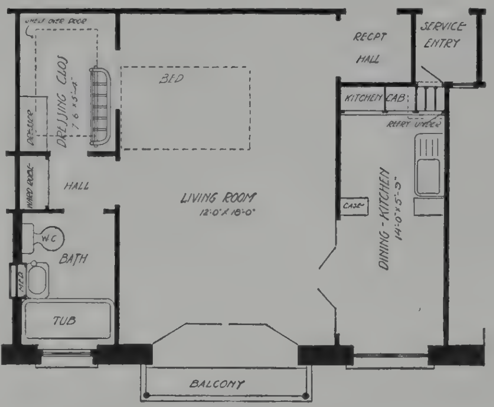
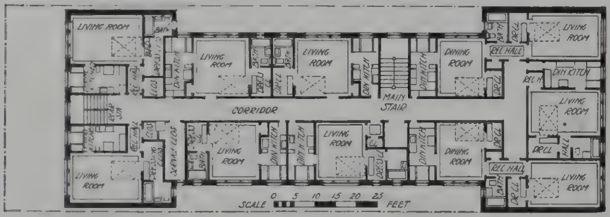


Fig. 1. The Two-Room Suite as a Unit
(Reproduced from last issue for reader's convenience)

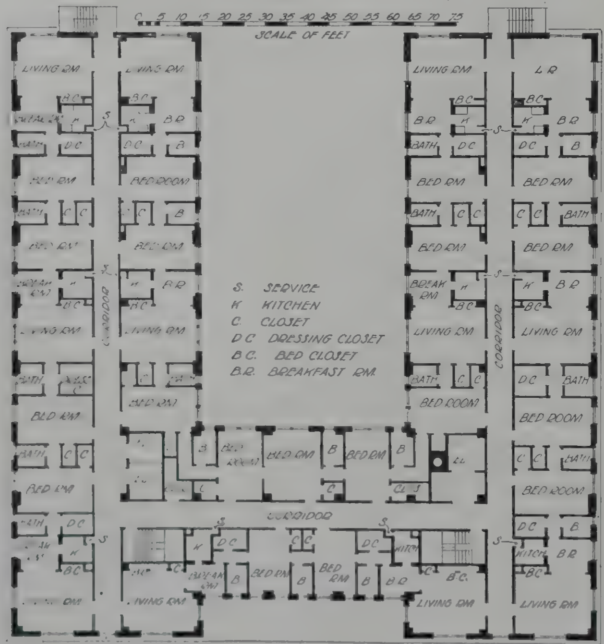
The service closet has, then, a twofold purpose: it acts as a guard against theft of parcels and insures that garbage odors do not enter the main corridor. If this were all, some less space consuming device would probably be arranged. It has a third important function, — that of buffer between the kitchenette and the main corridor for noise and cooking odors. The kitchen range hood is connected to ducts that are exhausted by fans. If to this is added a smaller volume of air moving out of the service closet, the main corridor should be free of the odors from the fragrant cabbage or the favorite spaghetti. It has been stated that in the higher buildings the movement of air through these ducts (without the fans operating) has been sufficient to keep the air in the halls fresh at all times. Whether this is true under all atmospheric conditions is problematical. It is needless to say that the tenant has no means of controlling the inlet to the vent ducts.

The equipment of the kitchenette requires most careful study (see Fig. 8). Space must be economized and yet every operation possible in a larger kitchen must be done here. In some apartments kitchen cabinets of well advertised fame have been used; in others similar principles have been used in specially designed cases. Cupboards of other types are also provided. The ever present broom must be cared for somewhere. An ironing board should be provided by the owner and arrangements made so that the inevitable washing and ironing may be done in the kitchen.

The kitchenette is separated from the dining room by china cases about 5 feet high, which shield the kitchen fixtures on each side from the dining room. The "diningette" has often been provided with built-in furniture, *i.e.*, a table with benches on each side. This has not proven as popular as the movable furniture (see Fig. 9) because of its lack of flexibility and its awkwardness.



Plan Showing Two- and Three-Room Units with Limited Hotel Service

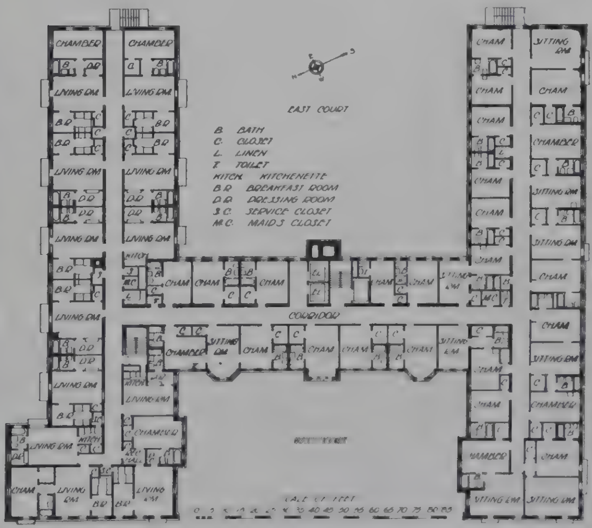


Apartments with Kitchenette and Non-Housekeeping Units
Richard E. Schmidt, Garden & Martin, Architects

GENERAL VIEW FROM THE WEST

THE ground floor of this building with its dining room, cafe, tea room, banquet or ballroom and service arrangements has very much the same accommodations as the metropolitan hotel. There are tenants' entrances on the south and west leading to a central office and spacious lobby opening on to a walled garden on the north of the block. Fourteen shops, together with the cafe, take the entire frontage of the two streets. With the exception of a small front entrance court the whole area of the rectangle is covered by the first floor layout. Interior views are shown on page 74.

DETAIL OF MAIN COURT ENTRANCE



TYPICAL FLOOR PLAN

NORTH SHORE APARTMENTS, EVANSTON, ILL.

ROBERT S. DeGOLYER, ARCHITECT

In Fig. 1 the dining room and kitchen are indicated 5 feet 9 inches wide. This is almost, if not quite, the absolute minimum; ordinarily they are 6 feet 6 inches wide and upward. A dining room 8 feet wide and 10 feet long, or more, is desirable in the better buildings. The kitchen need not be more than 6 feet wide—more is waste—and only long enough to house the equipment, none of which can be spared. A receptacle should be provided in the dining room for the attachment of the myriad electric cooking devices. In the living room it is obvious that many of these receptacles are necessary.

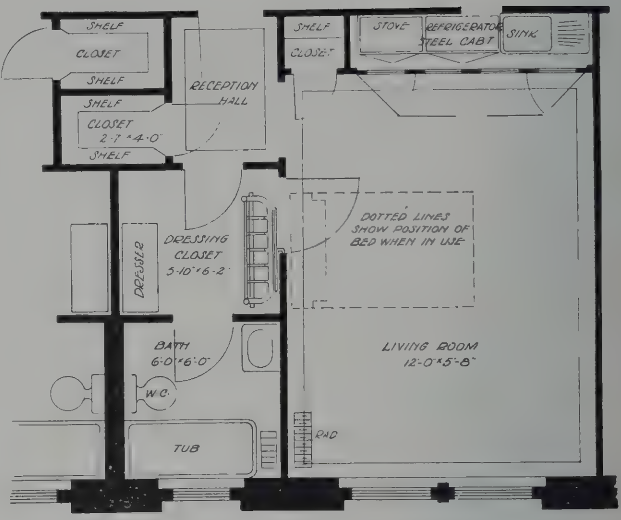


Fig. 10. Plan of One-Room Apartment with Fittings

Hitherto the accepted arrangement has been to assemble as many of these housekeeping units as possible on one floor. For economy the bathrooms and the kitchens are together. To fill in the corners three-room units have been introduced as at the "Surf." Experience has shown that a greater flexibility is needed, and in projects now under consideration two bedrooms and a bath are introduced between each pair of bedrooms. By this means almost any size family may be accommodated, either with or without kitchenette. It may be a two-room suite of plan Fig. 1; it may be one or two rooms with bath and no kitchenette; it may be three or four rooms and kitchenette. A building arranged in this way will fill a greater variety of demands from families than the less flexible arrangement and, during periods when the commercial hotels are crowded, it may be used to accommodate transient guests. In the North Shore Hotel both the kitchenette apartment and the hotel apartment are combined in one building, without this flexibility, however.

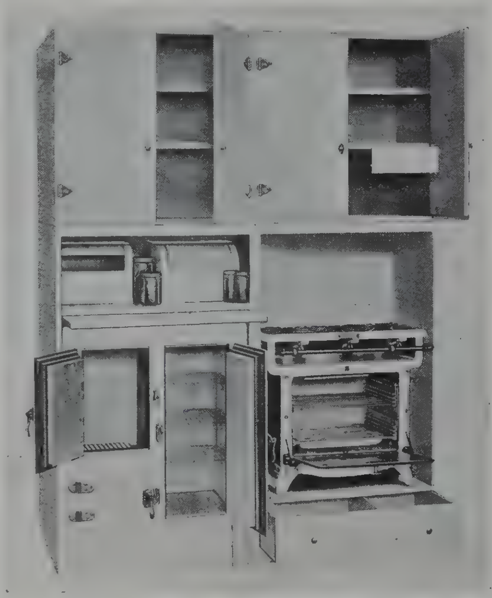
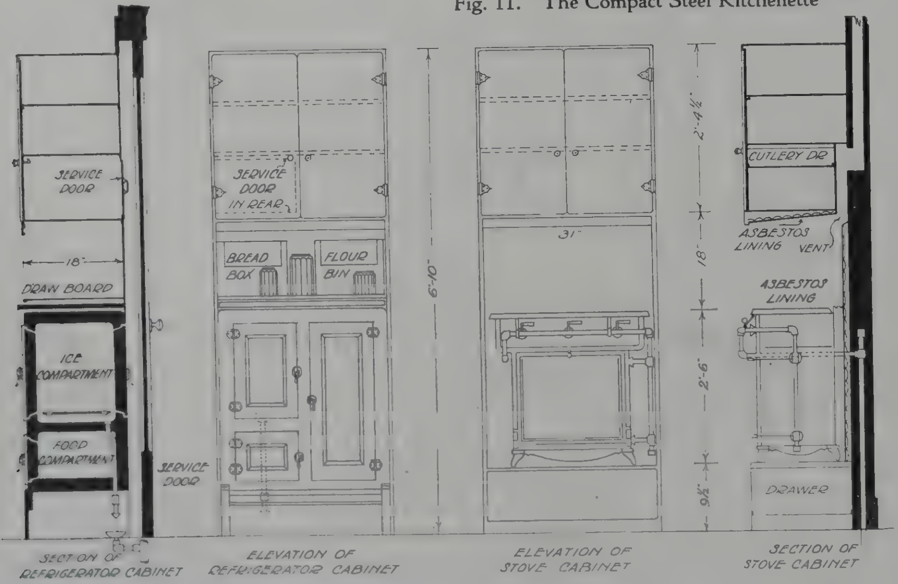


Fig. 11. The Compact Steel Kitchenette



Sections and Elevations of the Steel Kitchenette. Methods of Service from the Rear and Use of Insulation are Shown

Another type of "condensed" apartment is illustrated in plan Fig. 10, in which the one room goes on a 24-hour shift, for it now combines not only the living room-bedroom, but kitchen and dining room as well. The stove and refrigerator and sink are concealed behind fourfold doors. The disadvantages are obvious, and its popularity is considerably less than that of the kitchenette type; whether this is counterbalanced by the reduced floor area cannot be determined except by consideration of each case. The cooking arrangement is shown in Fig. 11. A still further condensation of the cooking is shown in Fig. 12; the sink has parted company with its drainboard,

now perforated and placed above it.

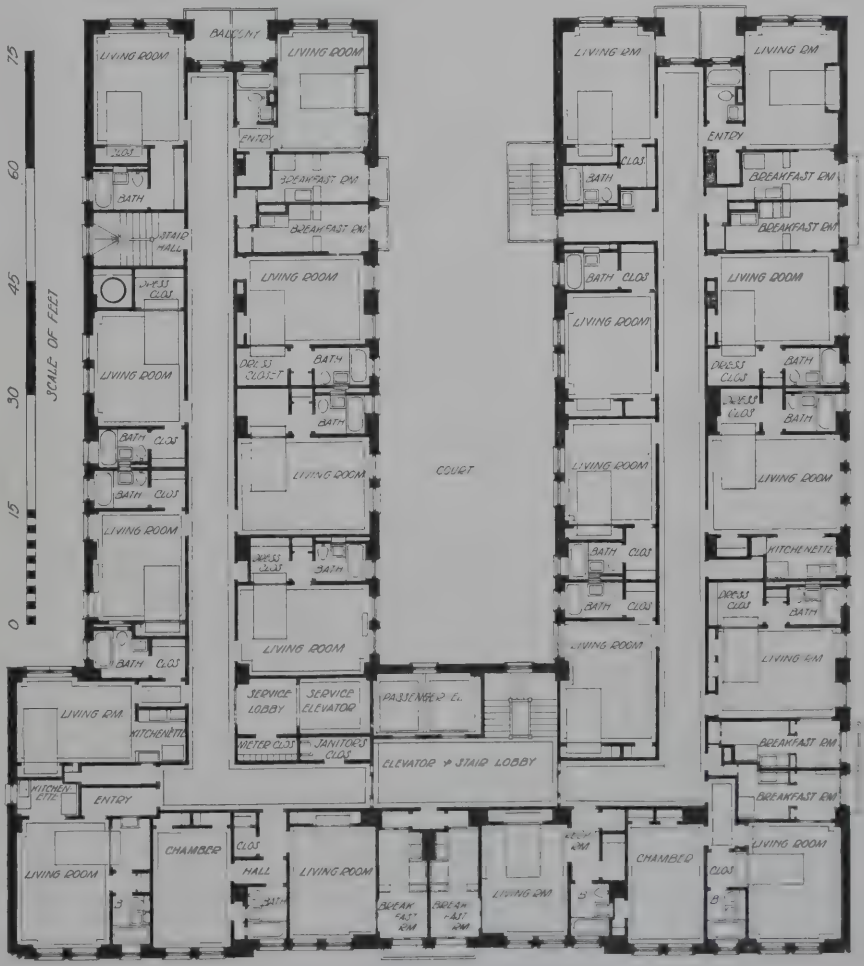
The public floors of this type of building vary from the sumptuous appointments and splendor of the "North Shore" to nothing but a vestibule in the three-story apartment. Only upon analysis of the kind of tenants, the neighborhood and the rentals is it possible to determine the first floor arrangement. The "North Shore" is so largely an ordinary family hotel that it would be unfair to use it as a comparison were there not projects now on foot in which the public space is almost as large. The "Surf" indicates another solution. It should be borne in mind that the need for public entertainment space is not as great as in the commercial hotel, as each apartment has an acceptable living room. Public dining rooms, too, are smaller. In some, shops have been found a profitable investment. Barber shops, hair dressing parlors, delicatessen stores, drug stores, are sometimes installed for the convenience of the guests, and a small cigar, magazine and candy stand is an essential in almost all of them. Dances are given at regular intervals at some places — at others, never.

Fig. 12. Introduction of the Sink with Drainboards Above

Somewhere in the depths it will be necessary to provide storage space for trunks, extra furniture, screens and a large workshop. The maids, bell boys, waitresses, cooks, etc., must have their locker rooms as in the hotels. Where possible it is advantageous to have a separate locker room about 4 by 6 feet or larger for each apartment. In the higher buildings no laundry is provided for the guests, though occasionally there may be a "house" laundry. In the three-story buildings it is customary to provide a laundry for each six apartments.

The disappearing bed has been profitably used in the commercial hotel in the sample rooms — even the mighty "Pennsylvania" stoops to use them. Its use here will continue and it would not be surprising to see its use in the commercial hotel extend to many of the ordinary rooms. A number of residential hotels without kitchenettes have installed the concealed beds, generally with a dressing closet. The results have been very gratifying to the owners.

As the architects and their clients become better acquainted with the disappearing bed, the kitchenette and the cabinet kitchen, it is very probable that a far more extensive use will be made of them. For the inexpensive summer cottage with its "peak loads" they seem specially well fitted.



Typical Floor Plan, Wrightwood Apartments, Chicago, Ill.
Hall & Ostergren, Architects

Dining-Kitchenette and Typical Living Room of the North Shore Apartments, Evanston, Ill.

Whether these devices could not be used in the small, suburban house is at least a subject for contemplative speculation. Probably a courageous or "foolhardy" builder will some day convert this speculation into a more material one. Probably with profit for himself and, if perchance honestly built, with lasting satisfaction for the buyer. In the studio apartment these devices are obviously in place. In institutions of all kinds where it is necessary to house a large personnel, many of whom are married, many of the devices will do much to reduce the cost of building.

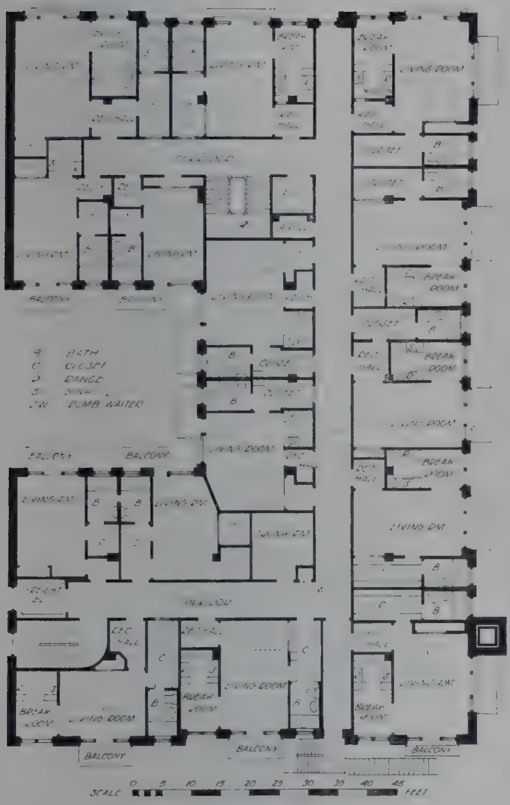
The tendency of most of us is to "pooh-pooh" and "bah-bah" the numerous new devices and schemes that are presented to us — a painfully developed, protective armor. But much as we may regret this slum-housing of the bourgeois, and, alas! even of the plutocrat; much as we may regret the passing of "14 rooms — 8 baths — 27 closets, its Grande Salon and its Salle-a-Manger, etc.," let us curse the immigration laws, if we must, but at least let us recognize the economic situation (a highbrow camouflage for shortage of help). The kitchenette apartments are the logical development of the steadily decreasing family quarters: a child, moreover, of the ordinary apartment mated to the scarcity of domestic help. The war and increased building costs have simply accelerated its birth.

NOTE. The Surf Hotel was published January, 1920.

End of Main Lobby

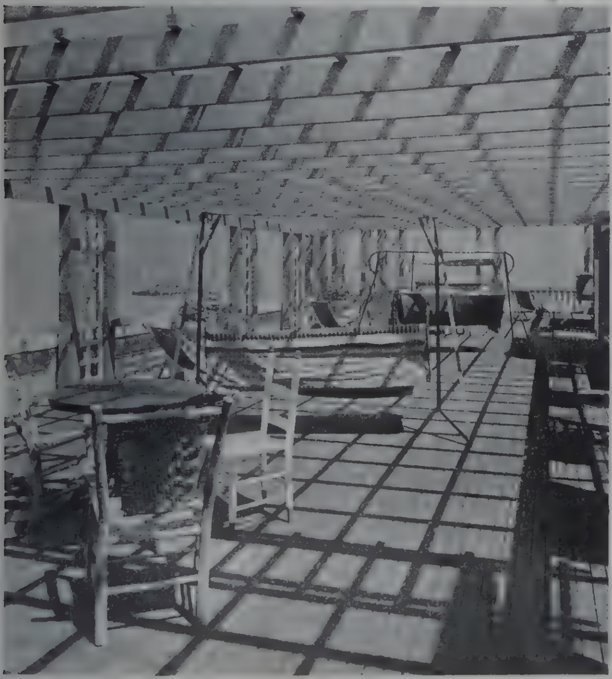
Tea Room

The North Shore Apartments, Evanston, Ill., Robert S. DeGolyer, Architect



TYPICAL FLOOR PLAN

ON the ground floor of this building at the right of the main entrance lobby and office is a lounging room and behind this a ballroom with its anterooms. Two small apartments and a superintendent's quarters are on the left front. A common laundry, storage space and heating plant take up the remainder of the floor space at the rear. The kitchenettes in many of the apartments shown on the above plan open from the living rooms.



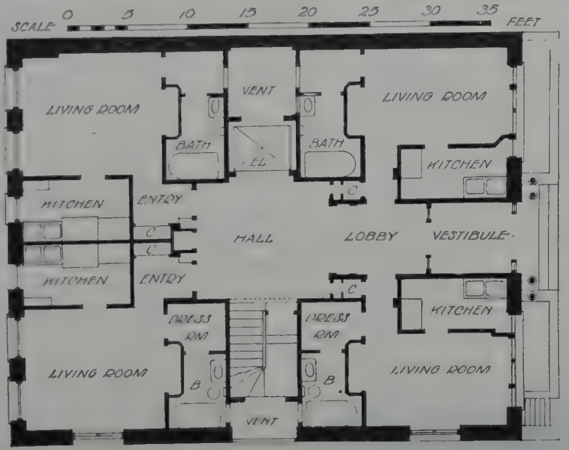
ROOF GARDEN

ENTRANCE LOBBY

EASTWOOD BEACH APARTMENTS, CHICAGO, ILL.

JOHN A. NYDEN, ARCHITECT

ENTRANCE LOBBY AND STAIR HALL



THE plan shown at the left is the first, or street floor, with vestibule and lobby entrance to the stair hall. On the second and above floors the apartments are symmetrical about the central hallway, being in pairs and typical of the rear apartments on the first floor.

The kitchenettes on the front of the building take over that space occupied by the entrance, and the living rooms are the same width as those in the rear with similar entries. A niche at the end of each living room takes a wall bed, and among the housekeeping conveniences are cold chests below the kitchenette windows.

RANDOLPH APARTMENTS, SAN FRANCISCO, CALIF.
HART WOOD AND HORACE G. SIMPSON, ARCHITECTS
(Formerly Wood & Simpson)

GENERAL VIEW FROM STREET

The Y. M. C. A. Hotel, Chicago, Ill.

ROBERT C. BERLIN, ARCHITECT; JAMES GAMBLE ROGERS, CONSULTING ARCHITECT

Second Floor Stair Hall and Elevator Lobby

TO the many young men that enter daily the large cities of the country in search of employment, hotel and living accommodations present a serious problem. Many are without sufficient funds to patronize the usual hotels, and the cheaper lodging houses often are in the midst of unpleasant environment. The need for simple quarters at a moderate cost has been recognized by the Y. M. C. A. and supplied in Chicago in a large hotel.

Its purpose is to provide a temporary residence in a wholesome environment for men of moderate means. Operating expense has been reduced to a minimum, with the result that a small bedroom simply but substantially furnished may be secured for about 50 cents a day. Restaurant service of two kinds is provided: the main dining room is operated on the cafeteria principle and has space for 360 men; the lunch room, where service is entirely at counters, is located at the left of the hotel entrance with direct communication to the street.

The building is entirely fireproof, of steel, tile and concrete construction. It is nineteen stories in height, with basement and sub-basement, and occupies an area of 96 by 165 feet. The exterior is of gray face brick and terra cotta.

On the first floor and connected with the entrance lobby are private offices where those in charge of personal service and relief work centering at the hotel may hold interviews.

The entire second floor is given over to lounging rooms. In the center of the space are writing rooms, newsstand, telephone booths, manager's office, etc. The rear lobby is used in the evening for an assembly room for lectures and motion pictures. It has a seating capacity of 500 people.

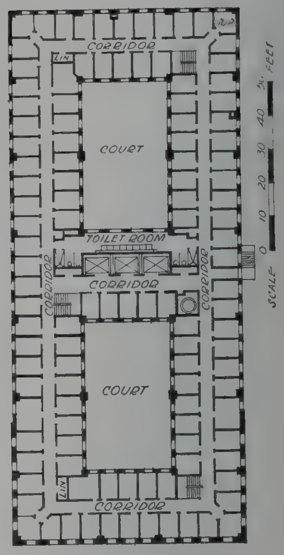
The sixteen typical floors contain 1,821 small bedrooms. They are steam heated, well lighted and ventilated. There are no toilet facilities in the individual rooms, but at a central location on each floor are shower baths and toilet rooms. In order to maintain the expense of caring for rooms at a minimum, their use is not permitted guests between the hours of 9 A.M. and 4 P.M.

The top floor is occupied by a spacious laundry, which takes care of all laundry of the hotel and also that of the twenty-eight other departments of the Chicago Association.

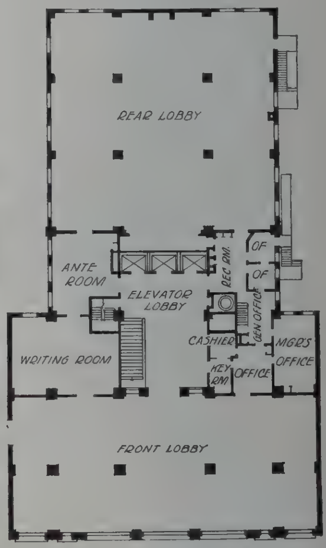
Dining Room on First Floor

Front Lobby on Second Floor

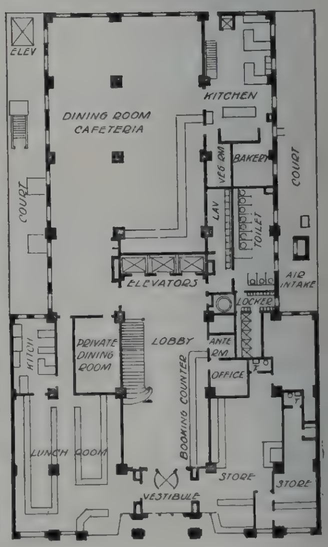
SOUTH WABASH AVENUE FACADE



TYPICAL FLOOR PLAN



SECOND FLOOR PLAN



FIRST FLOOR PLAN

THE Y. M. C. A. HOTEL, CHICAGO, ILL.

ROBERT C. BERLIN, ARCHITECT, JAMES GAMBLE ROGERS, CONSULTING ARCHITECT

Heating and Ventilating

By C. W. KIMBALL

THE items of building equipment included in the above heading are generally grouped together and thought of as one proposition and one system. This is brought about, without doubt, by the fact that the two systems when installed in a building are often made to work together and to depend upon each other for their successful operation. Also, in certain installations, the two are so constructed that neither one is complete without the other.

The two systems a greater part of the time, however, are designed and installed for two separate purposes. The heating system is included as a part of the equipment to keep the building warm, dry and fit for occupancy or other purposes requiring warmth. The ventilation system, generally speaking, is included as an addition to the heating system to supply fresh air, remove odors, supply necessary humidity, and make the building more comfortable, healthy and desirable.

This last feature is coming to be used more and more commercially, and proper ventilation of the better class of theaters, stores, schoolhouses, shops, mills, garages, assembly halls and buildings of this type is required more and more by owners who benefit by their own and others' past experience, which proves that proper ventilation means increased revenue.

Both heating and ventilation systems have been improved and refined during recent years, and better working, simpler and more economical systems are now generally required, due to the resultant advantages of quietness and efficiency in operation. It is no longer necessary to install systems of heating requiring 20 to 30 pounds pressure to drive the steam and water through the piping and radiation, as in the past, when "noise" was a customary part of a heating system.

Any heating system, as a unit, reducing it to its simplest terms, means some arrangement of material and apparatus designed and constructed for the purposes of transferring the heat units released when fuel is burned in the furnaces, boilers or heaters, to the rooms or spaces to be heated. The term "heat units" used above refers to "British Thermal Unit," sometimes written "B.T.U.," and is the standard unit of measurement used throughout heating calculations.

This unit represents the amount of heat that is required to raise the temperature of one pound of water from 62 to 63 degrees Fahrenheit. As this term is used as a standard all through the subject of heating and ventilation, entering into a great many calculations regarding the heating value of fuel, heat transferred to steam, water and air, and heat released by these agents to the rooms to be heated, the following list may be helpful in illustrating the "heat unit" relation of different items:

High grade soft coal has 14,000 to 15,000 B.T.U. per pound.

High grade anthracite coal has 12,000 to 14,000 B.T.U. per pound.

Good grade of fuel oil has 18,000 B.T.U. per pound, or 150,000 per gallon.

Each square foot of cast iron direct steam radiation gives off 250 B.T.U. per hour.

Each square foot of cast iron direct hot water radiation gives off 170 B.T.U. per hour.

One cubic foot of air raised 0 to 70 degrees requires 1,435 B.T.U.

One square foot of single thick glass 0 degrees outside, 70 degrees inside, transmits 76 B.T.U. per hour.

One square foot of wall of house 0 degrees outside, 70 degrees inside, transmits 20 B.T.U. per hour.

One square foot of 12 inch brick wall, lathed and plastered on inside, 0 degrees outside, transmits 14 B.T.U. per hour.

One square foot of fan coil surface may transmit as high as 16,000 B.T.U. per hour.

One square foot of steam coil surface in hot water tank as high as 16,000 B.T.U. per hour.

All these quantities will vary as conditions change, but the above list will show some of the relative quantities.

The mediums most generally used to take up the heat units of the fuel when burned and carry them to the rooms to be heated, there to be released to warm the rooms, are air, water, steam and electricity, the latter, on account of cost, being used to only a moderate extent.

The different systems using the above mediums

are many and varied, but the following table gives an outline of the better-known systems:

AIR

Hot air furnace systems.
Hot air furnace systems combined with fans.
Hot blast fan system (air being heated by fire, steam or water).

WATER

Gravity hot water:
    Open system.
Gravity hot water:
    Closed or pressure system.
Forced hot water:
    Pump system.
Combined hot water and sprinkler system.

STEAM

Vapor or very low pressure steam (4 to 8 ounce pressure).
Low pressure steam systems:
    One-pipe up feed.
    One-pipe down feed.
    One-pipe circuit system.
Low pressure steam systems:
    Two-pipe up feed.
    Two-pipe down feed.
Low pressure steam systems:
    Three-pipe up feed.
    Three-pipe down feed.
Low pressure steam, Paul system.
Low pressure, vacuum return system.
Low pressure, vented open return system.

ELECTRICITY

Using resistance units for heating radiators.

Each of these systems is and has been used as the basis of special systems with special names which will not exactly fit the titles given above, but an analysis will generally show that the special system depends on some one of these for its fundamentals.

Hot Air Furnace System

In general, this system includes a furnace set either in the basement or in one of the rooms of the building, with a cold air duct connected to the furnace from the outside air to supply the air ducts or flues leading from the furnace to the various rooms to be heated.

The furnace is either cased in and surrounded with a galvanized metal jacket or with brick walls to conduct the air from the cold air duct around and over the hot iron surfaces where it is heated, thence to pipes leading from the top of the casing or hot air chamber to the rooms to be heated.

The larger sized furnaces are often cased in with brick and have masonry heat ducts rising to the rooms above. With a fireproof ceiling over these furnaces and with a liberal size cold air duct supplemented by a recirculation duct to draw air from the rooms above when the rooms are not occupied, a high grade installation for small schools, lodges, churches, small shops and buildings of this character is obtained. Many schools have been heated in this way and the comparatively small installations are satisfactory, while the large ones requiring two or more furnaces do not usually operate as well.

Furnaces for heating should be limited to comparatively small houses, churches, halls, stores and buildings of that character. In fact, during the last few years the use of steam and hot water has become more general in these small buildings, as the better results seem to warrant the increase in the first cost.

Hot Air Furnace Combined with Fans

This system follows the same general lines as the one previously described, with the addition of fans or blowers to increase the speed and volume of the air through the furnace and to the rooms. Often an undersize furnace or one with insufficient pipe sizes can be made to operate satisfactorily if a small, motor-driven fan is installed that can be used on cold days to force additional warm air into the rooms.

Patented tubular or sectional furnaces have been designed to heat air in large quantities so that by the use of fans large buildings may be heated, taking the heat directly from the furnaces to the air. At one time this system was put on the market and the claim made that this way of heating would do away with steam and hot water systems. Defects in construction of the furnaces and difficulty in properly distributing the heat developed have caused this type of apparatus to be practically withdrawn. It was found very difficult to prevent cracking of castings, opening of joints, leakage of gas into the air ducts, and comparatively large loss of heat through the sides of the large air ducts necessary.

Hot Blast Fan System

This heading includes all the heating systems which are based on the principle of heating air at some central point and then blowing it, by the use of fans of various types, to spaces to be heated. For certain work this system has many advantages, as the apparatus with its fan, engine or motor, heating coils and steam piping is all centralized, and only hot air ducts of masonry or sheet iron

need be run to the rooms. This system also supplies fresh air for ventilation, as the air handled by the fan is generally drawn from out-of-doors. For foundries, shops, certain mills and other buildings where there is smoke, odors or dust in the air, this system helps materially to improve the conditions and to supply a limited amount of ventilation.

The main parts of the system are the fresh air fans (engine, motor or belt driven), the heaters (steam, hot water or furnaces) to heat the air, and the duct system (masonry or sheet iron) to distribute the air.

With this system it is customary to take the air from out-of-doors, heat it to 120 to 140 degrees, and supply enough air to change the air in the rooms from ten to fifteen times per hour. The fans must be proportioned to handle the amount of air indicated above without overspeeding, as this causes vibration and noise.

The fan may be located so as to draw its air through the heaters or to blow it through the heater, this heater being located in the main air duct, as best suits the plans of the building. In some cases part of the heater is located in the air duct between the cold air opening and the fan, and the balance of the heater is located beyond the fan in the discharge duct, so arranged with by pass ducts under or around these heaters with dampers in each duct as to give separate control of the heat to the different parts or rooms of the building where different temperatures are desired.

Hot Water Gravity System

The main parts of this system are the boiler or heater with its smoke pipe, trimmings, grates, etc., flow and return mains, risers, radiators, vents and expansion tank with its vent and overflow.

With this system the water is heated in the boilers or heaters, the heated water flowing by gravity through the supply mains and risers to the radiators where the heat is given off to the air. The water cooled after passing through the radiator flows back to the boiler. This action is based on the principle that heated water has a tendency to rise and cooler water to drop. The water is usually heated to about 140 to 200 degrees, sometimes a still lower temperature if ample radiation is provided, but never over 210 degrees.

In the up feed, two-pipe system the flow mains pitch upward from the boiler to the radiation and the return mains pitch downward from the radiators to the boiler, the mains being generally in the basement and the radiation all above the heater. There is also the one-pipe circuit system, so-called, where the flow mains feed the radiators and the returns go back into the same pipe which gradually drops toward the heater. This system is used very little as the circulation is not so positive and even, as in the two-pipe system. Another system is the overhead down feed with the supply mains rising to a point above all the radiation, and the feed pipes dropping down to the radiation with returns extended from the radiators to the basement and thence to boiler.

As water when it is heated expands 4 to 6 per cent of its volume, it is necessary to provide an expansion tank to allow for the expansion and contraction of the water in the system as the degree of heat varies. This tank size varies as the amount of radiation required varies.

This tank in the ordinary system should be located well above the top of the highest radiator or pipe (the higher the better) and out of danger of freezing. It should have an open vent and a water-pipe connection with valve for filling the system with water and also an overflow pipe connected to a basement drain.

Gravity Hot Water (Pressure System)

The main part and description of this system are the same as the "open system" except as it applies to the expansion tank piping.

Instead of there being an open expansion tank vented to the atmosphere the tank in some cases is entirely omitted, putting on in its place an open relief valve and connecting the city water pressure with check valve directly to system. In other cases the tank is installed and a pressure regulating device is attached to the vent pipe from the tank to allow of raising a small amount of pressure (the amount being controlled by the regulator) on the water system, thus permitting the water to be heated higher than 212 degrees. This permits the use of smaller piping, due to the greater temperature of the water, and for the same reason the radiator sizes can be figured smaller. Many open vent or plain gravity systems which did not properly heat certain rooms have been fixed by putting this device on and raising the temperature of the water in the whole system, thus giving more heat for all radiators.

This feature of the system is a great help in larger installations, for by increasing the temperature of the water the speed of the circulation is increased all through the piping, and the radiators heat up more quickly than they otherwise would.

Hot Water System with Basement Tank

There has been patented and put on the market a system having the expansion tank in the basement, this tank having an air cushion to take up

the expansion and contraction of the water in the system with proper automatic devices to protect the system from too much pressure. This system is in successful use in houses and smaller commercial buildings.

Forced Hot Water System

This system is the same as the gravity system with the addition of a pump or pumps, which force the heated water through the entire system of piping and radiation.

The radiation surface should be figured approximately the same as for the other systems of hot water heat. It has been found that the most successful systems of this kind are those which limit the water temperature, leaving the main heater to 200 degrees as a maximum and allow approximately 30 degrees drop in temperature of water during the entire circulation.

With this system of heating the flow pipes to the radiation can be graded up or down, and the radiation can be above or below the heater, as the pumps force the water through the piping and radiation wherever located. To get an even circulation of water and distribution of heat the sizes of the pipes must be carefully selected, and in each branch of the system valves should be installed to regulate this distribution.

It is also necessary to have some method of caring for the change in volume of the water when it is heated or cooled. Some of the earlier systems had safety valves which opened as the water was heated and relieved the excess of pressure with a special water connection (with reducing pressure valve and check) from the city water mains. When the water in the system cooled and decreased in bulk this connection restored the volume balance.

The better and more recent systems have expansion tanks which are kept under approximately the same pressure as the system. A small air pump is provided which pumps air into this tank and thus provides an elastic cushion which expands or contracts to care for the change in volume of the water as the temperature varies.

One of the valuable points with this system is the fact that the temperature of the whole heating system can be varied with the weather. In other words, the colder the outside weather the warmer the water, and *vice versa*, thus a control of the whole heating system is possible at one point.

This system is adapted to factories, central plant systems, large buildings of all kinds — in fact, to any large heating proposition except possibly where the building or parts of it are warmed only part of the time, and at other times the temperature is allowed to drop below freezing, such as in armories, storehouses, etc.

Combined Hot Water and Sprinkler System

This system, as its name implies, performs two functions through a single set of pipes, — that of fire protection by automatic sprinklers, and also a hot water heating system of the best type.

Starting with a standard wet sprinkler system, there are four additions necessary to make it a heating system as well: a boiler or steam heater for heating the water; tying the ends of the sprinkler laterals into a system of returns to the boiler or heater so that the water can be reheated; a means of insulating the sprinkler head from heat of the circulating water. This is a very simple device inserted between the sprinkler lateral and the head which removes any danger of the head getting hot enough to open — a method of taking care of the expansion and contraction of the water as the temperature varies.

The heating surface contained in the pipes of the sprinkler system will usually contain from 60 to 200 per cent of the amount required to heat the building, depending on its construction, location and occupancy. Any additional radiation needed is supplied in coils or radiators and made part of the system.

The combined system is best adapted to buildings having large open areas in the greater part, such as are used for warehouses, manufacturing plants, mercantile establishments and for large public garages.

The system has been in commercial operation for over ten years and has met with success when it has been properly installed.

Vapor System of Heating

Under this heading are included the systems of steam heating, which operate with a pressure of 4 to 12 ounces only in the supply main, with an open vented return system to allow the water of condensation from the radiators to flow back to the boiler, and the air expelled from the system to escape through one or more vent pipes to atmosphere.

There are many different ideas worked out and many different variations of this system, and it is sold and recommended under many different names.

The vapor system will be discussed in further detail in the next issue. Mr. Kimball will also write on the vacuum systems. — EDITOR.

Inspection of Concrete

By BURTIS BROWN, C.E.

"TO accept or not to accept" seems to be the query of many architects when a concrete building is completed. Most building materials are made in a factory under expert supervision; whereas concrete is frequently made with a newly organized construction gang which does not know the fine points of the work, and it is under the latter conditions that the architect has his most difficult task. In order to have a finished structure with the required amount of strength and finished appearance, satisfactory materials must be used. The first consideration is therefore the inspection of the materials.

Cement. At present the mills are shipping cement of very satisfactory quality, and any cement obtained directly from the mills under the specifications of the American Society for Testing Materials can be depended upon. Cement bought in small quantities from local dealers should be watched.

Care should be taken to have the cement stored in a weather-tight building, with a floor at least one foot from the ground to allow for circulation of air beneath. Never allow the bags to be piled against the walls of the storehouse, as dampness often penetrates the walls. Keep each shipment separate, in order to identify any consignment.

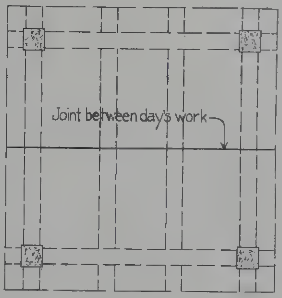


Fig. 1

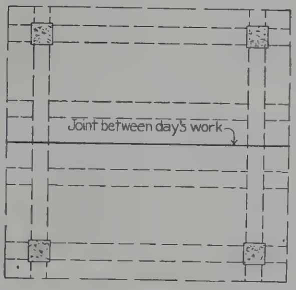


Fig. 2

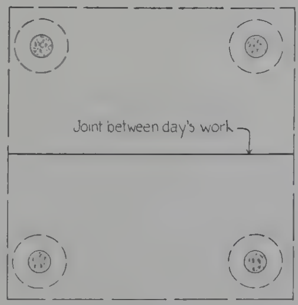


Fig. 3

On a construction of magnitude, regular laboratory cement tests should be frequently made. If there is not time to wait for the results of the laboratory tests, mix up a small batch of cement and sand, mould a 6-inch or 8-inch cube, also another of cement, sand and stone, and observe the action. With a very little experience one can tell whether the cement is satisfactory.

Sand. The really troublesome material in concrete making is sand. For some unknown reason there are some sands that cannot be used with certain cements. The bothersome sand with another cement may work satisfactorily. A field test at least should be made to ascertain whether the materials are usable, unless sand from the same bank has already proven satisfactory with the same cement. Cubes of sand, as mentioned above for cement, will afford a preliminary test.

Clean sand should be insisted upon. If there is a stain left when the sand is rubbed between the fingers, the sand is not clean. Another test is made by filling a glass jar about three-quarters full of sand, to which is added enough water to cover the sand. After vigorously shaking and allowing the mixture to settle, if fine silt exceeds 5 per cent in height, have a complete laboratory test made before using the sand. Wash the sand if necessary.

The size of the grain of sand is not of prime importance, although it is worthy of some attention. To be considered as sand, the grain should not pass through ¼ inch mesh and be uniformly graded to dust. By mixing two sands oftentimes a smooth concrete can be obtained.

Stone or Gravel. Whichever of these materials is specified, should be clean. Demand washing if an excess of dust adheres to either one. It is necessary to have the coarser aggregate clean. The size of the material should be called for in the specifications. The usual sizes are as follows:

3 to ¼ inch mesh for heavy foundations or walls.

2 to ¼ inch mesh for small foundations or walls.

1 to ¼ inch mesh for reinforced work.

¾ to ¼ inch mesh for spirally reinforced columns.

Water. It is necessary to have clean water for mixing concrete. Any water clean enough for a public water supply will be satisfactory. If it is contemplated to use less pure water, have it tested for its action with other materials.

Steel. Reinforcing steel purchased from any of the steel companies need not be tested itself; however, care should be used in placing the reinforcement to have it located as shown on the drawings. In thin slabs as much as 40 per cent reduction in the strength of the slab may be made by the rods being raised only ½ inch higher than they should be.

See that the same number and size of rods called for is placed on the forms and securely wired in together. Either concrete or metal spacers should be used to hold the rods in position. Then watch carefully to see that the steel does not become misplaced while concreting. Sleeves, hangers, anchors, etc.,

should be securely in place before concreting begins. Fill sleeves with sand to prevent concrete from filling them while pouring.

Forms. During the erection of all forms there should be inspection to prevent a break or settlement while the concrete is being poured. Have boxes placed on the forms where openings are to be left in the floor. Forms should be constructed so the bottoms of beams and girders, also the struts beneath, may remain undisturbed for a longer time than the slab bottom or beam and girder sides.

Concrete. Be sure to get the proportions called for on the drawings or in the specifications. If necessary, have measuring boxes built for the amount of sand and also for the stone to be used. The wheelbarrows, carts or buggies used to convey the aggregates to the mixer should be marked and care taken to see they are not overloaded.

The proper consistency or wetness of the mix is still debated, but wet mixes are favored for practical work. Due to the different amounts of water there may be in the sand or stone piles, the amount of water cannot be specified as a percentage of the volume of the aggregate, but must be judged by the resulting product. Concrete of such consistency that it must be handled quickly to prevent its running off the shovel, is a good rule.

Machine mixed concrete is to be preferred, but good concrete may be mixed by hand. Concrete is properly mixed when every particle of sand is covered with wet cement, and every particle of stone is covered with mortar.

Convey the mixed concrete from the mixer to the forms as quickly as possible and in such a manner as to prevent separation of the various parts of the mixture. There is a difference in the time of set in various cements, so that a definite time limit cannot be given. No concrete should ever be allowed to be deposited in the forms if it has its initial set. Always wet the forms before placing concrete. Continue to wet the forms as the work advances. If possible, have a richer mix used at the beginning of the work, because some cement will cling to the mixer, the hoist and wheelbarrows; besides the first batch is usually spread quite thin on the forms. It is most satisfactory to have the first batch of mortar "no stone."

Have the work as monolithic as possible. Pour the columns and walls carrying floors at least four hours in advance of the floors. It is better to pour them a day ahead. This is to allow for settlement in the columns and walls, and saves cracks in the floor around the columns. In flat slab work, never pour the column above the point where the capital flares. Keep spades and chisels busy while pouring beams and columns to press the stone back from the surface. Screeds should be placed on forms at the grade of the finished work, then a straight edge drawn from screed to screed, thus leveling off the surface of the concrete.

Bulkheads should be placed where joints are to be made at the end of a day's work. Joints should be made where the shear is zero, or nearly zero, and the steel is carrying all the tension and the concrete all the compression. The joint for a beam and girder type floor is shown in Figs. 1 and 2 and for a flat slab floor is shown in Fig. 3. Never make a joint at the edge of a beam or at the edge of a column. Arrange the work so the break at noon hour will come as nearly as possible to the same location as a joint at the end of a day's work.

Prohibit men from walking on the fresh concrete. Wet the concrete in hot weather to prevent too rapid drying or protect it with canvas. In cold weather, heat the materials and use artificial heat to warm the concrete until set.

Keep a record on a drawing of the section concreted each day. Note the date, the weather and temperature at 8 A.M., 12 noon and at 4 P.M. Compute the yardage for each day's work and check with the number of bags of cement used for the volume of concrete.

Removal of Forms. Nearly all failures occur when the forms are removed and the ordinary diagnosis is "premature removal of forms." Every one knows there is a great difference in the rate of drying at various seasons of the year and on different days. It depends to a large extent on the amount of moisture in the air and the temperature. In cold weather, below 40 degrees F., concrete hardens very slowly.

The first test usually made by a practical man is to press his finger against the concrete or to knock it with his shoe. If these tests are satisfactory, he may try driving a tenpenny nail, and if the nail bends double, it shows that the surface is hard at that particular spot. Several tests are necessary to make sure that the nail has not struck a stone. The ring of hardened concrete when hit by a hammer is another indication of sufficient setting. If it is suspected that the concrete is frozen, apply heat with a torch to see if beads of moisture appear. Never remove forms from frozen concrete.

The following rules are to be used with discretion for the time of removal of forms:

	Days in Summer	Days in Winter
Sides of columns	2	4
Slab bottom and side of beams	6	14
Posts under beams and girders provided posts are left longer for large girders	10	21 to 30
Forms for thin retaining walls	2	5
Forms for thick retaining walls	1 to 3	4

For winter work count only the days when the temperature is above 40 degrees F.

Interior Decoration

FRENCH ARCHITECTURE AND DECORATION OF THE REGENCY AND LOUIS XV

By MATLACK PRICE

ARCHITECTURE and decoration in France following the long and powerful reign of Louis XIV are as generally familiar to-day as they are generally misunderstood or misvalued.

In architecture, as in history, we are rather inclined to accept certain ready-made premises to which the mere constant repetition from year to year adds weight and substance. Baroqué architecture, for instance, is almost unanimously dismissed as unspeakably atrocious, and the style of Louis XV as decadent and immoral. True as these statements may be in some directions, their acceptance as the whole truth is unfortunate, and a little sympathetic study will reveal a great many beauties and merits which the sometimes ruthless architectural historian has obscured by a smoke-screen of anathema.

The present paper, concerning itself with the style of Louis XV, will endeavor to pick out from an admittedly large amount of decorative frivolity and license certain fundamental merits and excellences of design which hold a very real message for the architect and decorator of to-day.

The span of the style is given by the most accurate architectural historians as extending from 1710 to 1770, and covering contemporaneously the English reigns of Queen Anne and the first three Georges.

Architecture and decoration under Louis XIV, dominated and directed by centralized and bureau-

Drawing Room in the Louis XV Style, New York City Residence
A. J. Bodker, Architect

A LOUIS XV DOORWAY

TROWBRIDGE & LIVINGSTON, ARCHITECTS

An interesting example of the modern restrained handling of the style. The illustration shows the characteristic over-door treatment with inset painting and the decoration of the wall panels. The ornament is in gold on a cream ground

cratic control, had exhibited a continuous struggle between Classic Renaissance Palladianism and late Renaissance Baroque, with the powerful influence of J. H. Mansart and his followers keeping the balance fairly well down on the side of monumental formalism.

With the dissolution of dominant official control of architecture and the fabrication of decorative materials and accessories under the Regent, Philip, there was a great artistic insurrection in which (if one failed to see beneath surface manifestations) all rules and conventions were thrown overboard to make way for unbridled license.

At this point the usual historian forces upon architecture and decoration an absolute identity with the life and morals of the period, and the result is a distinct verdict to the effect that all things pertaining to the period of the Regency and Louis XV are in flagrant bad taste and utterly unfit for modern use.

It must be said, however, that this indictment is so nearly true, and its margin of untruth so narrow, that it is by no means difficult to understand its prevalence. But it should not become an established fact, or a great injustice would be done to a group of brilliant architects and designers of the period, and the architects and designers of to-day would be the losers in failing to participate in their heritage of a very real and vivid, even if peculiar, kind of inspiration.

It should always be remembered, too, that the remarkable art of the period of Louis XV in France has suffered more than the art of any other period from base imitations. And so much of the work was purely inspirational, purely a thing of its own time, that its imitation by another people, in another age, could not but be vain and meaningless.

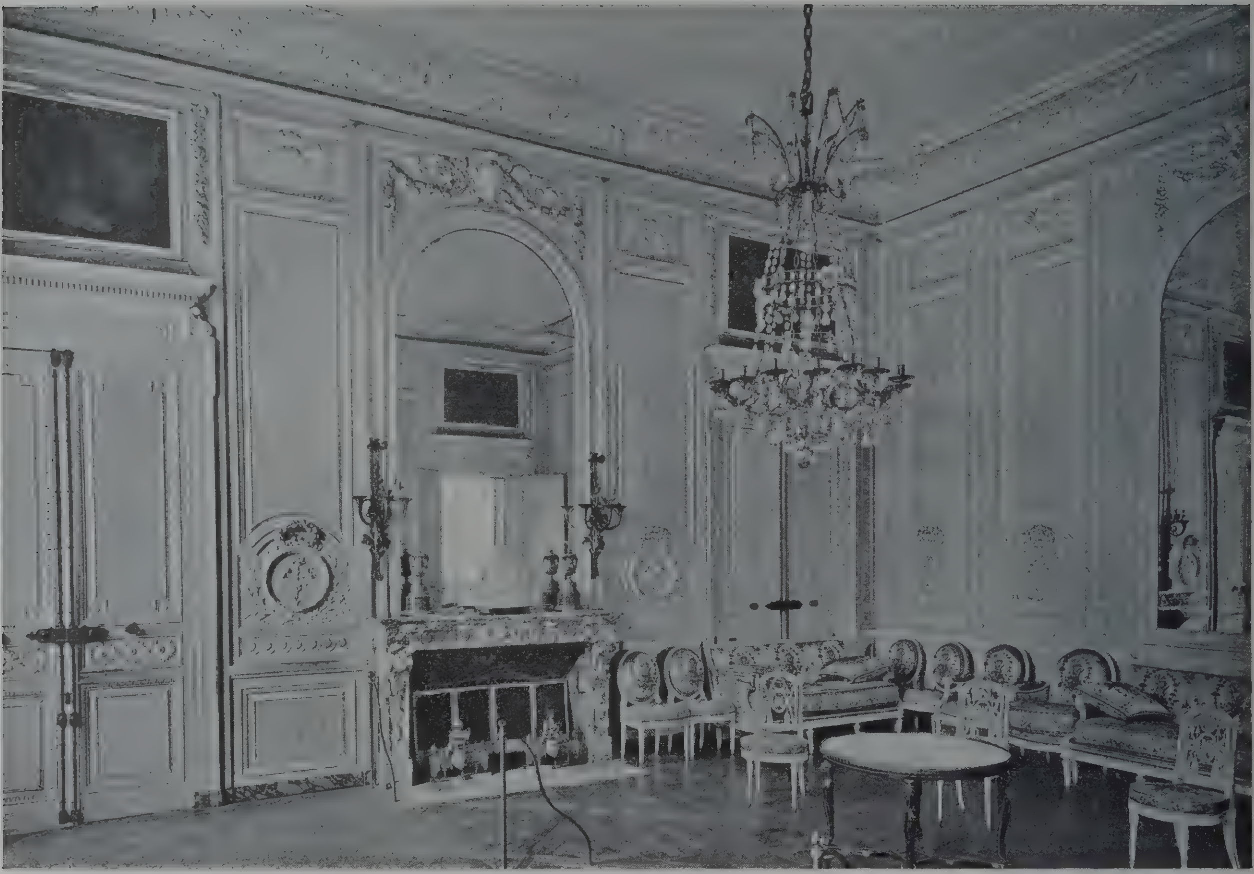
The style of Louis XV is not a thing to copy to-day, excepting by designers and decorators of rare ability and sympathy; it is not the tangible achievements of the Louis XV master-designers that we should seek to revive, but rather the genius and constructive imagination of their minds which made their masterpieces possible.

A conspicuous identity, certainly, is true of the life and art of the time. The fashion for sumptuous châteaux and town houses became even more general under the Regent and Louis XV than under Louis XIV. Luxury and the refinement and complexity of household equipment increased, and the aristocracy, free of the heavy formality and pomp imposed upon social intercourse by *le grand monarque*, turned to extremes of frivolity and extravagance. It was a period of whim and fantasy and caprice, reflected in every detail in contemporary art and decoration. The Court, and society in general, took a fancy, entirely for the sake of novelty, to play at pastoral rustic life, and gave elaborate outdoor entertainments in which the guests appeared as shepherds and shepherdesses. These and the more formal and immortally charming *fêtes champêtres* come down to us in all their picturesque gallantry in the decorative paintings of Watteau, Lancret and Boucher.

As though the fantastic compositions of "rock-and-shell" motives were not sufficiently gay, frivolous and unacademic, the designers desired decorative arrangements of Chinese motives which had just become known through the importations of the early Dutch traders, and from these "Chinoiseries" there was another nimble veering of fashionable caprice to "Singeries," in which the principal figures depicted were monkeys tricked out in the fashionable human raiment of the hour.

Such decorations were far removed from the architectural and monumental style of Louis XIV, but the whole idea of interior decoration had


Antechamber in Le Petit Trianon, Versailles, France



SALON, LE PETIT TRIANON, VERSAILLES, FRANCE

ANTECHAMBER OF THE KING, LE GRAND TRIANON, VERSAILLES, FRANCE

changed from the great formal apartments of the previous reign to rooms of a much more intimate kind — the *boudoir* and the *cabinet du conseil* and *petite appartements*.

The style of the Regency, being transitional from one period to another, did not possess many marked traits of its own, except to forecast in a large measure the conspicuous changes which were to take place a little later. There exists, perhaps, a certain amount of confusion in distinguishing the several rather loosely applied designations of the styles and sub-styles of Louis XV — such terms as "Rocaille," "Rococo" and "Pompadour."

The Rocaille style is not strictly synonymous with Rococo, for it applies properly to the school of design which was based on rock formations of the artificial sort employed in devising the elaborate grottoes which often formed a feature of the elaborate gardens of the period.

The Rococo style was evolved from a combination of "rocaille" motives and "coquille" or shell motives, combining in its name an elision of the syllables. Madame de Pompadour, one of the royal favorites, although a liberal and enlightened patroness of the arts, did not exercise nearly so great an influence as Marie Antoinette in the reign of Louis XVI, and the designation of any phase of the style of Louis XV as "Pompadour" is as meaningless as "Du Barry."

Among the great decorative designers of the day were Verberet, Rousseau, Oppenordt and Messonier — and the analytical student of their works must admit them to be, in some respects, greater designers — certainly more brilliant designers — than the masters of more formal and balanced styles.

Here we reach the most important point involved in the true appreciation of any work of the period of Louis XV. Granting all its fantasy, all its radical departure from academic precedent; granting even much of the "immorality" of its antagonists, there was always, underlying virtually all the decorative work of the period, a tremendous sense of *design* — even a sense of pure design.


Example of Brocade from the Louis XV Period

We find it in the creations of Messonier, for instance, which possessed at least as much of a sort of mad, elusive symmetry as the two figures in a Bacchanalian dance. Here is the essence of it: "His decorative foliage is swept upwards as by a whirlwind. His architecture appears to have passed through a semi-fluid state, during which it was agitated by a violent swell or convulsed by an earthquake before solidifying. Piers, entablatures, steps and balustrades bend backwards and forwards, surge up and down like the crests and troughs of a billowy sea. No element of chance, however, enters into these effects; they are the calculated result of a conscious art, seeking its effects by an elaborate system of balance and grouping."

The style, then, as exemplified by others as well as Messonier, was by no means a mad and unbridled riot, without plan or direction, but actually an example of the very heights of attainment in sheer *design*. And that is the most important thing to remember about it.

The apparently fantastic curved heads to panels and mirrors, the seemingly unstudied collision of straight and curved lines (which seemed never to hurt each other), the profusion of detailed ornaments and decorative "attributes" — all these were studied with unerring niceties by master-designers whose like is not to be found to-day on either side of the Atlantic.

Even the most fantastic compositions possessed a symmetry in *decorative value*, even if not in actual form or contour, and there was always a strong sense of the function and *direction* of ornament. Decoration was either confined to such locations as panels, over-doors or spandrels, or was given a specific purpose as part of a whole design.

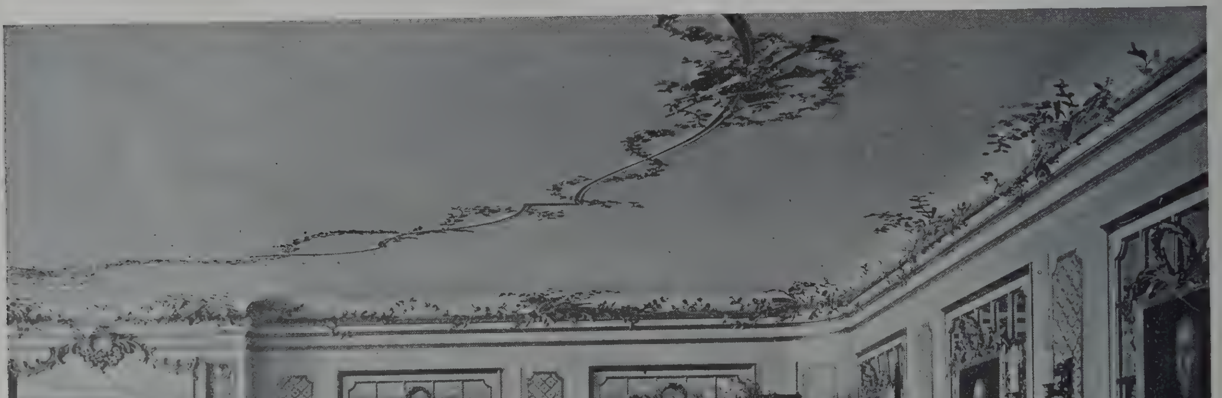
During the whole period, furniture, tapestries and superb decorative fabrics, metal work and intricate wood carving, came from the hands of accomplished designers and artisans; it was consistently a period of marvelous workmanship, as, indeed, was necessitated in the technical execution of such marvelous designs.

Let those who would disparage the works of this brilliant period of French art look at our own art of to-day to discover any elements of the vivid spontaneity and the inspired creative vigor of the style of Louis XV. Nor was there absence of thought for the architecture of the future, despite the seeming disregard for rule and procedure. The members of the Academy, which was definitely established in 1717, numbered forty toward the end of the reign, and though many of them fell in with the spirit of the times in their work, they were officially and at heart believers in the Classic Ideal and Palladianism and sent students to Rome. At this time, too, the first *ateliers* were opened and there commenced the strong architectural training which has ever since been drawing students from all parts of the world to study architecture in Paris.

It was because of this strong, preceptorial quality in the French architecture of the period, as well as owing to the massive framework of sound architectural principles established under Louis XIV, that the transition to the pure and restrained classicism of Louis XVI was possible.

The profusion of the decorative genius of the period of Louis XV, the curvilinear furniture, the delicate carving and gilding, the flowing curves and fantastic motives were, after all, but surface expressions: they did not mean a fundamental reversal of architectural principles, and for this reason should not be taken too seriously.

It was not a conservative period, and it bequeathed to latter-day architects an ideal style for theaters, hotels, salons and ballrooms — if latter-day architects can perform the mental feat of *thinking* the thoughts of the Louis XV designer, rather than the mechanical feat of copying the things he did.



Louis XV Room in the New York City Residence of Harry Payne Whitney, Esq.

Probably the most perfect example of the style in this country. The mantel is Louis XVI, also the mirrors, but the decorative ornament is essentially Louis XV. The furniture with tapestry covering is of the best period of Louis XV

McKim, Mead & White, Architects; Stanford White, Decorator

Building Specifications

By WALTER W. CLIFFORD, *Associate Member A.S.C.E.*

THE three R's which were considered the backbone of elementary education, within the memory of some now living, have their analogy in specification writing in the three C's. Clearness, completeness and conciseness are the essentials of a good specification.

Specifications and drawings being supplementary, much information may be placed either on the drawings or in the specifications. But duplication has the disadvantage that carelessness, such as a change made in one place but not another, leads easily to conflicting information. Economy also dictates that information will be given in one place only. An exception to the foregoing is the "In General" paragraph of the various divisions of the specification. In these it is often well to summarize concisely that division of the work.

Many factors enter into the choice of medium for conveying various parts of the information needed to construct a building. Typewriting is cheaper than lettering on tracings. Too many notes on a drawing make it very confusing to read. Certain drawings of building cross sections, happily not representative of modern practice, have complete specifications written over them at various angles and in various colors. A brief study of such a drawing suggests many things not to do. Certain information, however, is more accessible and more conveniently used if placed on drawings. A good criterion in this matter is to place on the drawings notes of the type and extent of the sundry materials of which an edifice is composed, and in the specifications the necessary additional information about their quality and workmanship.

Such notes as are made on drawings will, as far as possible, be grouped in a convenient location, commonly near the right hand margin. Certain information such as the words "brick," "limestone," "terra cotta," etc., on elevations will be placed for convenience on the face of the drawings where the materials occur. The rest of the information, such as floor grades on plans, type of flooring, standing finish, etc., will be placed in the collected notes.

Whatever division of labor be made between drawings and specifications, it is very important that each office have definite standards or at least well crystallized custom in the matter. Leaving the decision to the individual preference of various men is sure to lead to confusion.

The trend of modern architectural practice toward large and complex organizations makes the choice of the specification writer an important matter. In the one-man office the specification writer is sure to be properly informed about the drawings and any peculiarities of each job. In the larger offices, unless the organization is very good, specifications are sometimes written by men who have not sufficiently intimate knowledge of the various jobs. In many large offices a single man, with or without assistants, writes all the specifications. This man usually has no particular responsibility for the drawings, and it is very difficult for him to cram sufficient knowledge of the peculiarities of the individual job to write a good specification. In organizations of this type, excellent co-operation is required for successful work. It is often helpful if the man in charge of the drawings makes notes as the work progresses for the assistance of the specification writer. The man in charge of the drawings should also check the specifications if he is not their writer.

In some offices a man is assigned to a certain job, and devotes to it his whole time. Such a man usually writes the specifications and supervises the drawings. With this type of organization some jobs may have less expert specification writers than in the type previously mentioned, but their greater familiarity with the work more than offsets this, especially if there is a good office standard specification. This latter type of organization may be enlarged if the size of the work and extent of personnel warrant by assigning a man to each of the divisions of a job, such as — architectural, structural, mechanical and electrical. This division of labor has the previously mentioned advantage of thorough familiarity with a job. It requires common responsibility to some sort of office manager, and most of all it requires close co-operation.

The time to write specifications is not open to great differences of opinion. In the early or tentative stages of a job, outline specifications as well as preliminary sketches are often gotten out for approximate bids. The final specification cannot, however, be written until the drawings are near completion.

Methods of specification writing divide themselves into three classes, which may be called the haphazard, the synthetic and the analytic.

The haphazard method is that of the man who has no standard or system. A few old specifications of jobs similar to the one in hand in that they were buildings, and a greater or less assorted knowledge, often make up the raw material; scissors and paste, the tools. Quotations are mixed "to the satisfaction of the architect." The

result is a reminder of the military system of correspondence: when in doubt, put down the next number and take a fresh start. For a candid opinion of this method, turn a sympathetic ear to any contractor. He will tell perhaps how he discovered a nice description of a marquise in a recent specification, and after spending half an hour trying to find it, or even a likely place for it on the plans, went to the architect's office only to find that it did not belong in the specification at all. The contractor can probably quote many instances where ambiguity, omissions and misplaced items have wasted his time and cost him money. When the three C's are neglected, some one pays the bill.

The synthetic method is a name we may give to the various systems of "Card Specifications." Individual paragraphs are kept on separate cards, systematically filed and indexed. The individual specifications are composed by combining the proper cards. With sufficient system the entire specification can be ordered of the stenographer by catalogue numbers, so to speak. This method gives good results. Its salient weakness is, that specifications so drawn often lack coordination and logical arrangement.

In the analytic method the individual specification is prepared mainly by deletions from a standard building specification complete for the type or types of buildings handled by any specific office. This standard may be a multigraphed or printed form. It should contain complete text for all material specifications, and all workmanship requirements. For details of construction, paragraphs may be included for things which occur most frequently, and blank spaces left for other items. In such blanks there should be a note such as, "Include here all miscellaneous metal work except structural steel, and bronze or brass work," or, "Include here all pressed steel window frames, doors, door frames and trim. Wood frames should be included under 'carpentry.' Tinned doors and galvanized iron sash should be included under 'Roofing and Sheet Metal Work.'" Copious side notes should also be included in the form. By their use, certain parts may be marked for omission in a "short form," and useful reminders of matter to be added in other sections, when certain materials are used, may be included.

The advantages of the analytic method are its ease of use, the insurance against omissions, and the assurance of a clear and logically arranged result. However, there is no royal road to specification writing. Whatever method is used, hard and skilful work must be put into a specification if it is to be clear, complete and concise.

The synthetic and analytic methods of specification writing imply an office standard. Most large organizations have something of this kind, and all offices should have one. Specification weaknesses can be largely obviated by a well planned standard. And in addition to the satisfaction and publicity value of a good specification, with a good standard the individual specification will be lower in cost. An office standard specification is a very important thing and worthy of the talent of the best men of an organization. To write or revise a standard specification, it is necessary to start with the main headings and work down to the individual paragraphs. Once down to the trivial details, the big troubles are out of focus.

In an organization large enough to include experts in all lines, each main division with its standard order of secondary divisions may well be turned over to the expert in that particular line to work out the details. In a smaller organization, a main item may well be given to some one to study by reading and consultation with contractors and others. Even if the person is not sufficiently experienced to complete satisfactorily his part of the work, he can gather and arrange much valuable information, and by so doing be of great assistance. When an organization lacks experts on certain divisions of the work, it is well to admit it — within the sanctum sanctorum — and get some expert help on the subject. Some member can take care of the individual specification if he has a good standard and has followed its making.

In arranging the main items, brief notes on what is to be included in each should be made. As far as possible these headings should be separated as are the sub-contracts on the average job, and considerable study is necessary to accomplish this. In case of doubt, contractor friends may well be consulted. "Concrete Forms" under "Carpentry Work," "Hollow Metal Sash" under "Light Iron Work," or "Stairs" under "Structural Steel" may sound reasonable, but are likely to cause no end of trouble to some one. The main items will include such things as General Conditions, Excavation and Filling, Concrete, Brick Masonry, Terra Cotta, Structural Steel, Light Iron, etc.

These main items being in their proper places and all accounted for, the next thing is a standard arrangement of secondary topics to be used in the same order, as far as possible, under each item. Probably each division will start with "In General" or some like heading, which will contain a brief description of work included. This is a place where the three C's usually need to be emphasized, especially conciseness. After "In General" will follow, perhaps, Materials, Workmanship and Methods, Details of Construction. The items

under these headings will be further subdivided, as for example, "Forms" under

WORKMANSHIP AND METHODS.
- Forms.
  - 1a Material.
  - b May be omitted in some places.
  - c If wood to be planed.
  - 2a To be constructed rigidly and accurately.
  - b To be tight.
  - 3a Time of removal.
  - 4a Cleaning.
  - 5a Fillets required in some cases.

The man who is charged with working out the details of one of the main items may well stick to headings until he has one for each paragraph. With a completed outline any one familiar with a subject can fill in the paragraphs if he will keep in mind the three C's.

Proper coordination of topics can only be obtained by study of a complete outline; it may be lost in the assembled text. To have the arrangement of a specification indicate, perhaps, that "Materials" and "Skylight Curb" are of coordinate importance, is extremely confusing.

Having completed a standard specification, the question next arises: What will be the most convenient form in which to use it? It must, of course, be such that it can be turned over to the stenographer or printer with the least possible work. For the synthetic method each paragraph will be typed on a card with a proper index number. The paragraph outline may be duplicated as a guide for arrangement, and perhaps as an order blank for paragraphs. For the analytic method, the whole standard with notes will be printed. It is convenient to divide this large standard into separately bound chapters, each including one main subject. This avoids the necessity for crossing out entire sections, such as the entire steel specification for a job which has no structural steel. If the pages of these chapters be separately numbered thus: General Conditions A1, A2, A3, etc., Excavation and Filling B1, B2, B3, etc., each chapter may be treated independently without confusion of numbers.

Typography offers difficulties in the matter of clear arrangement. The relative importance of items must be indicated in the text as clearly as possible. Printed specifications offer unlimited opportunity for distinction in headings by varying the size and kind of type. Architectural specifications, however, are usually reproduced by some method which limits the typography to that of the typewriter. Clear distinction is more difficult in this case, but is still possible.

There are also minor points in specification writing which are sometimes neglected. A few still specify in detail the requirements for materials, like cement, when The American Society for Testing Materials has standard specification for most materials, which are difficult to improve and can be included by name in a few words. All specification writers should be familiar with these specifications. Some specify under general conditions that all materials shall be the best obtainable, and then specifically contradict the statement from time to time. Not a few are prone to the lazy man's refuge "shall be satisfactory to the architect." A contract at law is, among other things, an agreement to do a definite thing. There is always the possibility that a court would not hold the unknown thought in the back of an architect's head to be a "definite thing."

Making a specification stronger than will be enforced often detracts from one otherwise good. Specifying wrought iron when soft steel will be accepted, or sherardizing when galvanizing will be accepted, weakens the whole specification.

When the specification is complete, the question of indexing arises. Very commonly there is given a "Table of Contents," for which responsibility is usually, and often wisely, disclaimed by the writer. An index is much more useful and, if rightly done, entails no more work. With a standard alphabetical list of items it is not difficult to fill in page numbers for those which should be included and cross out the others. If the list is double spaced, it is also easy to add the occasional special item.

A consideration that may seem extraneous to the subject, and is indeed foreign to many specifications, is good English.

Mead* says, "In the preparation of specifications there is no more important matter than the use of good English." It must be remembered that, aside from the legal viewpoint, the foreman on the job must understand the specification if he is to follow it. One of Boston's famous literary men said, "Of course, the ordinary reader does not perceive delicate shades of expression or fine distinctions of phrase. Very likely he does not pause to consider whether a style is good or bad; certainly he would be unable to analyze its merits if he attempted this. It does not follow that these graces do not touch him. It is by means of them that deep and lasting effects are produced. Certainly if a writer desires to impress or persuade," if he has a specification he wishes followed, "he cannot too carefully cultivate the art of communicating it."

If more specification writers will follow this advice, who knows but what some one will some time write a specification so interesting that some one else will read it. And when this comes to pass for the contractor and architect, verily the millennium will be near.

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* "Contracts, Specifications and Engineering Relations." — DANIEL W. MEAD.

EDITORIAL COMMENT

AN interesting development of 1919 in New York is the culmination of the efforts of the "Save New York Committee"—a body of merchants interested in maintaining the character of Fifth avenue and vicinity, which has been seriously threatened by the coming of clothing manufacturing shops into the side streets. A group of clothing manufacturers have now effected a co-operative organization to build new loft buildings for the industry in the Pennsylvania Station district, where land is cheaper and rents will naturally be lower. Land has been acquired on Seventh avenue from 36th to 38th streets, running back 300 feet from the avenue. The buildings now projected will provide 1,400,000 square feet of floor space and the initial cost of the first units is estimated at $15,000,000. The average rental will be 50 cents per foot as compared with $2.50, the price the manufacturers are at present paying. This will have two results: a lessening in the cost of clothing and the removal of the crowds of clothing workers who swarm Fifth avenue to the detriment of the retail stores. The seriousness of the situation that has been existing may be realized when it is known that there are 2,190 shops between 14th and 48th streets adjacent to Fifth avenue, out of a total number of 3,312 for the entire city, employing in all 79,667 workers.

This movement is commendable as far as it goes, but it only indicates the greater benefits that would come to manufacturer, employee and city if only a little more foresight and imagination had been employed in meeting the problem, and its promoters gone the whole way and removed the industry from the heart of the city entirely. Manufacturing enterprises in the center of a large metropolis are no longer essential to its business welfare; in fact, as in the case of New York, they have proved to react to its detriment. The tremendous congestion that is engulfing the transportation systems of our cities, the narrow margin of time which is allowed for the carrying of food supplies to the urban population, and the constantly diminishing supply of sunshine and fresh air, make it most important that every means should be taken to prevent increasing such congestion. Instead of concentrating industrial establishments in commercial districts already crowded, the effort should be to create separate and independent manufacturing communities with space for their various supplementary activities.

While there may be an apparent temporary advantage in New York in moving the clothing manufacturers from the vicinity of Fifth avenue to a cheaper and less intensively developed section, the ultimate result is that the area of congestion is simply removed to another part of the city. These large loft buildings which are being erected will be a nucleus of another group of buildings which will house many thousands of workers, and the streets on which the buildings front will in turn become fully as crowded as Fifth avenue, and offer just as serious obstructions to traffic.

The workers will still have to travel the same or greater distances from their homes in the outlying sections of New York, or they must crowd themselves into living quarters on the west side, which are old and fast falling into disrepair, and in which there are neither adequate air nor sanitary conveniences, so that eventually a congested area will be created that will in future years bring up a new problem.

Only a little more intensive analysis would suggest a permanent solution of the difficulty. Industrial workers are being forced to go farther and farther beyond the city to find living quarters where rents will be commensurate with their earnings. Instead of placing the burden on the transportation companies to bring these people to the city each day, the industries themselves should move to the outlying districts where they will be near their source of labor. The facilities for receiving and shipping freight are now, in many cases, fully developed on the outskirts of cities, and where additional service is needed, it can more readily be supplied than in the congested center. Ground space is obtainable at a much lower figure, increase in plant capacity can be made with greater ease, the advantages of light and sunshine can be enjoyed to the utmost, and opportunities for wholesome and strength building recreation can be made available to the employees when it is once realized that manufacturing belongs in the open spaces surrounding our cities rather than in the center of its commercial activity. From the humanitarian point of view, the advantages are no less than from the purely business aspect. The workers will have the opportunity to enjoy greater time for the cultivation of home life and the exercise of their natural instinct to grow fruits and flowers,—time which is now consumed in uncomfortable traveling,—their food can be supplied them at a lower cost and with less danger of lack of supply through some emergency, and there will result, as a natural consequence, a more contented and unwarped view of their station in life which it is not difficult to perceive present industrial conditions well-nigh make impossible.

A section of the Barrett Specification 20-Year Roof on West Technical High School, Cleveland, Ohio. It was laid over another type of roof that had begun to deteriorate after only seven years of service.

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THE West Technical High School, Cleveland, Ohio, pictured above, has just been re-roofed with a Barrett Specification Roof *over another type of roof that had begun to deteriorate seriously after only seven years of service.*

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Manufacturers' Catalogs and Business Announcements

ANNOUNCEMENTS

Neil Gardner announces the removal of his office from 1341 North Second street, Abilene, Tex., to 302 P. & Q. Realty Building, Ranger, Tex., for the practice of architecture. Manufacturers' samples and catalogs requested.

The Ohio Board of Administration, Columbus, Ohio, announces the reorganization of their architectural department under the direction of Mr. Kyle W. Armstrong, architect, with offices at Oak and Ninth streets. Manufacturers' samples and catalogs requested.

W. V. Marshall, formerly of the firm of McIver, Cohagen & Marshall, Billings, Mont., announces the opening of an office for the general practice of architecture at Room 204, First National Bank Building, Missoula, Mont.

Mr. B. Hammett Seabury, Besse Building, Springfield, Mass., announces that on Jan. 1, 1920, Harry M. Seabury and J. Lewis Kelley became members of the firm of the B. Hammett Seabury Co.

Mr. Charles R. Kaufman announces the opening of offices at 127½ Main avenue N., Twin Falls, Ida., for the practice of architecture and is desirous of receiving manufacturers' samples and catalogs.

Mr. James E. Casale, architect, announces the removal of his offices from 569 Fifth avenue to temporary offices at 128 East 28th street. After May 1, 1920, he will be permanently located at 73 East 52d street, New York City.

The firm of Hoppin & Koen, architects, 4 East 43d street, New York City, take pleasure in announcing the admission of Mr. A. D. R. Sullivant as an associate member on Jan. 1, 1920.

Messrs. George W. Backoff, George Elwood Jones and J. Frederick Cook announce the copartnership for the general practice of architecture under the firm name of Backoff-Jones & Cook, with offices in the Union Building, 9-15 Clinton street, Newark, N. J.

Mr. James E. McLaughlin takes pleasure in announcing that he has taken into partnership Mr. G. Houston Burr, Jan. 1, 1920, and will continue the practice of architecture under the firm name of McLaughlin & Burr, with offices at 88 Tremont street, Boston, Mass.

Mr. Abram R. Rutan has opened offices for the general practice of architecture in the Second National Bank Building, Paterson, N. J. Manufacturers' samples and catalogs requested.

Messrs. William J. Todd and Harry T. Miller, architects and engineers, announce the opening of an office at 213 Masonic Building, Phœnix, Ariz., and are desirous of obtaining manufacturers' samples and catalogs.

Mr. A. A. Baerresen announces that Mr. Frederic Hutchinson Porter of Salem, Mass., is a partner in the new firm of Baerresen & Porter, with offices at 1821 Carey avenue, Cheyenne, Wyo. Catalogs requested.

Mr. Glenn Allen, architect and manager of construction, announces the removal of his office to The Georges Company Building, corner of Market and Aurora streets, Stockton, Calif.

BOOK REVIEW

USEFUL DATA on Reinforced Concrete Building for the Designer and Estimator. By the Engineering Staff of the Corrugated Bar Company of Buffalo, N. Y. 216 pages with charts and illustrations. 5 by 8 inches. Leather bound. Price, $2.50.

This book, just issued by the Corrugated Bar Company, gives every indication of being of much value to architects and engineers. It will take its place beside the hand books of the steel companies and will undoubtedly be as frequently consulted since concrete now takes such a prominent place in the designs of to-day. Its principal value, undoubtedly, will be to those who have some knowledge of concrete design, and by the use of the tables and charts there presented, preliminary designs and estimates can undoubtedly be more readily made than from any other hand book as yet published. It will also be of aid to the beginner in the use of some of the tables, but it can in no wise be considered a text book.

By the use of this book one can readily compare the type of girder and beam construction and also obtain much information relative to the flat slab.

This hand book will also be very useful in the checking up of designs in a preliminary way. It is not too technical in its explanation and still the information contained is presented in such a way as to be of great value. The customary tables on properties of sections are presented in a very practical and concise manner.

The tables on beam loading and moments, with the graphic illustrations, will be of great assistance to architects and engineers, and the resume of the building law requirements, together with the weights of material and storage warehouse notes, will greatly assist in the design of industrial structures.

The general information contained is valuable and is tabulated in a well chosen manner, so that the architect and engineer may readily find data usually discovered only after some search.

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CONTENTS for MARCH 1920

PLATE ILLUSTRATIONS

LETTERPRESS

ALBERT J. MacDONALD, Editor

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G. H. Schwan-Arch.
Newark, N. J.
THE DOVETAILED KEY LOCKS THE PLASTER
BISHOPRIC STUCCO AND PLASTER BOARD
TRADE-MARK
REGISTERED

THE EDITORS FORUM

ITALIAN AND FRENCH DETAILS

THE publication of the measured drawings of Italian and French Renaissance details announced a few months ago begins in this issue with two interesting examples from Italy. They will appear in every other subsequent issue. The measurements for these drawings were secured by William D. Foster following the demobilization of the A. E. F. Art Training Center at Bellevūe, France, where he acted as Assistant Adjutant Historian. The drawings are examples of excellent draftsmanship, and they have been reproduced carefully to retain the character of the original line. They are, furthermore, shown at actual scale to make them of the greatest value.

JANUARY BUILDING FIGURES

THE great volume of construction begun in the closing months of 1919 — a brief résumé of which was published in our January issue — is being followed consistently into 1920, and from reports now available for the first month of this year it is evident that the prediction of $3,000,000,000 of construction in 1920 will be reached.

The American Contractor states that the total volume of building permits for January in 193 cities is $117,747,298, showing a gain of more than 440 per cent over the corresponding period of 1919, the total for the same cities in January, 1919, being $21,732,529. Cost of construction has greatly increased in the year, but considering this, it is evident that present activity in building is far in access of normal. It indicates the great necessity that exists on all sides for buildings, because this amount of construction has been undertaken in the face of obstacles that at any other time would be overpowering. Lack of investment money, shortage of labor and material supplies are even now holding back a great amount of building for which there is immediate need, and every effort should be made in the building industry to proceed with present construction on as economical a basis as possible so that our resources may be extended over as large a field as possible.

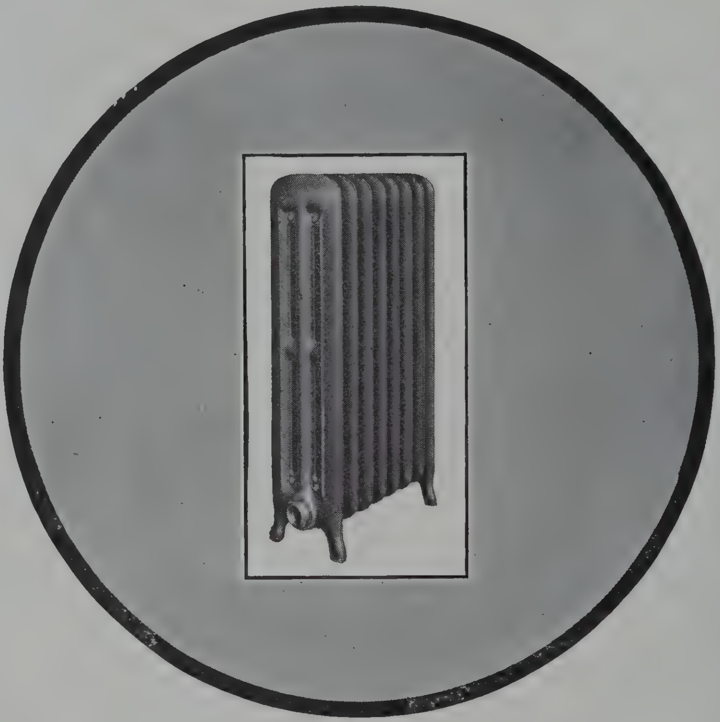
STANDARD SIZE FOR BRICK

THE interest the Government displayed during the war in the larger industries of the country has been instrumental in making clear to manufacturer and consumer alike the value of standardization, practiced to a reasonable degree. There is evident here and there an impression that standardization will solve all difficulties, and that everybody and everything should immediately submit to its dictation. This would be retrogression surely, but there is a happy medium that will bring large benefits and to which all can subscribe. This is especially true in the matter of sizes of units of building materials used throughout the country in substantially the same manner. Brick is such a unit that should be standard, but heretofore different manufacturing conditions have prevailed, and as many different sizes have resulted. It will interest architects to know that at the Convention of the Common Brick Manufacturers' Association of America, held in Columbus, Ohio, on February 16, 17 and 18, it was unanimously voted to adopt the size 2¼ by 3¾ by 8 inches as the standard. Committee C-3 of the American Society for Testing Materials, also meeting in Columbus, was asked to change its tentative brick size to the same, on which it agreed. This size had previously been adopted by the American Face Brick Association and the National Brick Manufacturers' Association, so it may now be considered a national standard. There are several reasons for the adoption of this size; in the matter of bonding and pattern work, considering a ½-inch joint most usual, two headers plus a joint equal the length of a stretcher, so that any bond may be used without difficulty. Also, in the thickness of walls, it will now be possible for building codes to specify wall thicknesses without fractions.

ROTCH TRAVELING SCHOLARSHIP

ON account of war conditions this scholarship has not been awarded for two years, but will be resumed this year. Preliminary examinations will be held at the office of the Secretary, C. H. Blackall, 20 Beacon street, Boston, on Monday and Tuesday, April 12 and 13, 1920, at 9 A.M., to be followed by the sketch for Competition in Design on Saturday, April 17, 1920, at the Boston Architectural Club, 16 Somerset street. The successful candidate will receive annually for two years an amount which it is hoped will not be less than $1,400 per year, to be expended in foreign travel and study. Candidates must be under thirty-two years of age and must have been engaged in professional work for two years in the employ of a practising architect residing in Massachusetts. Holders of a degree from a recognized architectural school may present their certificates in lieu of the preliminary examinations. Candidates are requested to register at the office of the Secretary as soon before the examinations as practicable, so that accommodations may be arranged.

United States Radiators



Getting around to the subject of radiators——

EVERY architect knows that his clientele will be better satisfied by purchasing heating material that is proving entirely satisfactory in service, quality and appearance.

ALSO, every architect will agree that radiators of standard manufacture and reputation should have consideration.

THIS then, explains exactly why

United States Radiators are Specified

UNITED STATES RADIATOR CORPORATION

GENERAL OFFICES: DETROIT, MICHIGAN

BRANCH OFFICES IN PRINCIPAL CITIES

PENCIL SKETCH OF AN INTERIOR
BY O. R. EGGERS
John Russell Pope, Architect

The
ARCHITECTURAL
FORUM

VOLUME XXXII MARCH 1920 NUMBER 3

Domestic Architecture of California

ILLUSTRATING THE INFLUENCE OF THE SPANISH AND ITALIAN RENAISSANCE

PART I

By WILLIAM WINTHROP KENT

ARCHITECTURE in California has for the layman or the student two periods worth consideration, namely, its earlier manifestations in Spanish Colonial and the modern development of that and of the Italian Renaissance.

Of the earlier examples there are fortunately remaining the ruined and restored Spanish missions, ranch buildings, simple dwellings and a few especially instructive public buildings.

The ecclesiastical buildings show that it was to religious architecture that the Spanish and Spanish-Mexican settlers gave special consideration in California, as was also the case in the Southwest generally and Mexico.

The missions are still in condition to be easily studied and are in the general style of Spanish Renaissance, which we call Spanish Colonial, verging often on Baroque, with traces of Moorish influence.

The familiar type is that of a church front with one or two towers, often, as at Santa Barbara and San Luis Rey, flanked by an arcade. The entrance is generally round arched, and the usual cloister or *patio* is surrounded by arcades of round arches. Occasionally the square headed opening with column, or pier and lintel, is seen on the exterior, as at San Luis Obispo and San Antonio de Pala, but generally the round arch prevails. The church is often barrel vaulted and at San Juan Capistrano it was roofed by domes; while the towers, generally heavy and low, with chamfered corners, are marked by string courses into stories. These towers have usually the round arch and a domed top, while others are mere belfry walls or arched piers with tops in curved, capped lines.

In private dwellings the court or *patio* is a common feature in both town and country, and is sometimes open on one side; but the column and lintel in the court and the square headed window in the outer wall take the place of the more costly round or Romanesque arch which the *padres* used in the missions.

In most buildings, public or private, *adobe* or clay-mud bricks, sun dried, were used in the walls, which were often made three or four feet thick and sometimes thicker. The roof timbers were covered with brush, or tule or bulrush stalks, and on this were laid the curved red tiles of dull variegated tones such as are used in France, Italy and Spain to-day.

In many of the missions and the better class of other constructions the walls and piers were made


San Luis Rey Mission


Santa Barbara Mission

House at Sierra Madra
R. D. Farquhar, Architect

House at Altadena
Reginald D. Johnson, Architect

of red tilelike bricks, and tiled floors were commonly laid in rooms and on cloistered walks.

In all this early work, therefore, we see very direct, simple and beautiful methods employed to get chiefly practical results, comparatively little attention being given to ornamental detail or mouldings, except in the missions, where often the Indian workman was, as at Capistrano, Santa Barbara, Carmel and elsewhere, allowed to invent the designs for architraves, door-heads and general ornament. The result of this simple, sturdy building was that the walls rarely, if ever, had too many or too large doors and windows, but only such as the means and necessities of the builders permitted. Therefore, while the eaves projected sometimes but slightly, the bulky buttresses on side and corner always reinforced a blank wall of sufficient extent to receive beautiful gradations of shadow, which wall also set off the darkness of an opening by a broad, sunlighted surface. Also the troweled plastering of the *adobe* wall caught the sun and shadow on its slightly wavy and roughened surface, somewhat as the paper of an old Japanese print took unevenly on its surface of beautiful texture the inimitable tones of color from the block.

Later art, the art that succeeded that of the Spanish Colonial structures, gradually lost not only the appreciation of the values and beauty of blank wall surfaces but finally the very texture of the wall itself, because the modern man in church and house building often demanded more windows and insisted on a mechanically straight and hard wall surface, even if plastered. So in a similar way by the use of inferior and less lovingly chosen paper and colors has the Japanese workman, trying to please Western taste, lost the beauty of the old *ukiyoye* print that Hokusai and Hiroshige demanded and got.

This unavoidable descent from a plane of simple, honest and picturesque architecture to the banality of certain buildings that Californians and newcomers erected later, was a misfortune from which the state is only just beginning to recover.

It is hard to give the exact date when this recovery began, this modern tendency toward more

House of L. C. Brand, Esq., at Altadena
A. D. Hill and J. S. Burley, Associated Architects

House of Tod Ford, Jr., Esq., at Pasadena
Reginald D. Johnson, Architect

MAIN ENTRANCE DETAIL, HOUSE OF HERBERT COPPELL, ESQ., PASADENA, CAL.
BERTRAM GROSVENOR GOODHUE, ARCHITECT

classic simplicity and more honest building, but it is safe to credit its beginning to the effect of the World's Fair in Chicago, which led to later ambitious and successful attempts in the Buffalo, St. Louis, San Francisco and San Diego Expositions to improve not only commercial but architectural conditions.

All these "World's Fairs" or "Expositions" were, therefore, of immense educational importance, and had not only local but widespread effect, especially in architecture. This is indicated in the subsequent steady improvement, not only in the designs of architecture itself, but in those of the minor accessory arts.

In California, without making any invidious comparison between the two exhibitions of San Francisco and San Diego, it is permissible to say that it was chiefly the San Diego Exposition which roused the present appreciation of Spanish Colonial architecture. The writer believes, and has heard it often from other travelers, that nowhere to-day is there a more beautifully designed and logically detailed group of modern buildings than those of the principal part of the San Diego Exposition, enhanced as it is by that monumental and impressive arcaded viaduct which leads the eye to the dominating tower and dome. It is true that this exposition is the greatest single factor influencing the present growth of good Spanish Colonial architecture in California, yet its influence would have been comparatively weak and ineffective had the seed fallen on poor soil. However, this was bound, fortunately, to be otherwise, inasmuch as California possessed not only an appreciative public, but what was equally effective, many young, well trained and enthusiastic architects to whom the various virtues of the historic style strongly appealed.

Also it is not entirely to the influence of the expositions and of San Diego's in particular that the present improvement in design is to be attributed. Both eastern and Californian clients of wealth and education had before this time given to various architects the opportunity and encouragement to make radical departures from formerly acceptable commonplace methods and designs, and so a noticeable improvement already had begun.

The Romanesque revival of Richardson, admirable in many qualities when controlled by such a master, followed by the Italian revival of Messrs. McKim, Mead & White, and some of the later work of the returned Beaux Arts scholars, had reached and affected California, but no one of these forces had made a lasting impression on its domestic architecture. Even the Spanish and the

House of Herbert Coppell, Esq., Pasadena, Cal.
Bertram Grosvenor Goodhue, Architect

WEST ENTRANCE DETAIL, HOUSE OF HERBERT COPPELL, ESQ., PASADENA, CAL.
BERTRAM GROSVENOR GOODHUE, ARCHITECT

Byzantine Romanesque work at Leland Stanford University, and the successful designs by M. Besnard for the buildings of the University of California, had apparently had little or no effect, — certainly not enough to show that Californians and others deemed any one of these styles to be suited historically or climatically to California.

There was evident, however, in domestic architectural work a strong feeling that upon some classical basis, such as Greek, Roman, or the later Italian and Spanish schools, could be begun a style which would harmonize with all local conditions.

Detail of Doorway
House of A. L. Garford, Esq., Pasadena, Cal.
Marston & Van Pelt, Architects

Classic art is now renascent in California, which fact, while not leading directly to a distinct national or even local style, is most interesting and suited to the climate and landscape, while its buildings are often of great beauty. Such a house is that of Miss T. H. Graham at Sierra Madre, near Pasadena. It is a dwelling of medium size but of striking individuality, of which the most noticeable feature in a long façade is the setting back of the second story so as to secure a terrace at that level across the entire front, flanked by pergolas or open loggias over which at present temporary dried palm branches rest in place of coming vines. In this home the designer has succeeded where many other architects fail. I know of no prototype in Italy unless at Positano.

Not many miles from this, at Altadena, is a house designed by Reginald D. Johnson, a less usual but very successful dwelling most fortunately placed where the view of it from the road is helped, as good designs generally are, by a background of the mountains.

Farther up the hill, at Altadena, is the residence of Mr. L. C. Brand, in the Spanish Colonial style. It is a very attractive house in its general proportions, picturesqueness and detail.

In the Spanish Colonial style originally, and to-day when well followed, the value of broad, blank wall surfaces is made the most of and utilized to enhance the effect of whatever ornament is placed about wall and window opening or by itself.

To this simplicity of plain wall, often slightly hand roughed, there was added by the early Spanish builders a restrained use of mouldings and the proper projection of eaves. One may safely say that in Spanish work, as elsewhere, a large expanse of wall and a few openings in proper scale surpass in beauty many openings in a small proportion of blank wall.

In many of the modern Spanish Colonial houses of California a very slight projection is given to the eaves, in accordance with the practical custom of certain early Californian builders of tiled roofs to which, on the less expensive type of structure, only enough overhang was given to secure a good drip and protect the wall below from wash, discoloration and disintegration. A slight eaves projection gives the effect of a very simple and inexpensive wall, such as that of an old farm or ranch house, but it is also true that the effect of antiquity may be secured even with a great eaves projection.

It cannot be denied that the use of a well ornamented and detailed doorway or window placed properly in a simple, even bare, wall of which the other openings are kept plain, is a very effective and interesting feature—one which has been often and effectively struck by modern designers, and yet logically and practically also it would seem better designing (where a coping wall is not called for) to avoid in such a design the farmhouse effect of no eaves projection whatever, as seen in certain houses, and give the eaves enough to secure a drip and a shadow commensurate with the quality of the rest of the façade.

The detail of Spanish mouldings and either profuse or simple ornament is beautifully enhanced in many modern examples by the simplicity of the walls, and by a painstaking adherence to hand-finished plaster on those walls, as has been secured on the Coppell and Ford houses in Pasadena and others. When the sun strikes the roughness at certain angles the suggestion of age is given and weathering soon makes it a permanent effect of varying tones. This characteristic architecture is achieved through a simple expression of structure accompanied by a logical use of local materials.

Interior Decoration

DECORATION AND FURNITURE OF THE LOUIS XVI PERIOD

By MATLACK PRICE

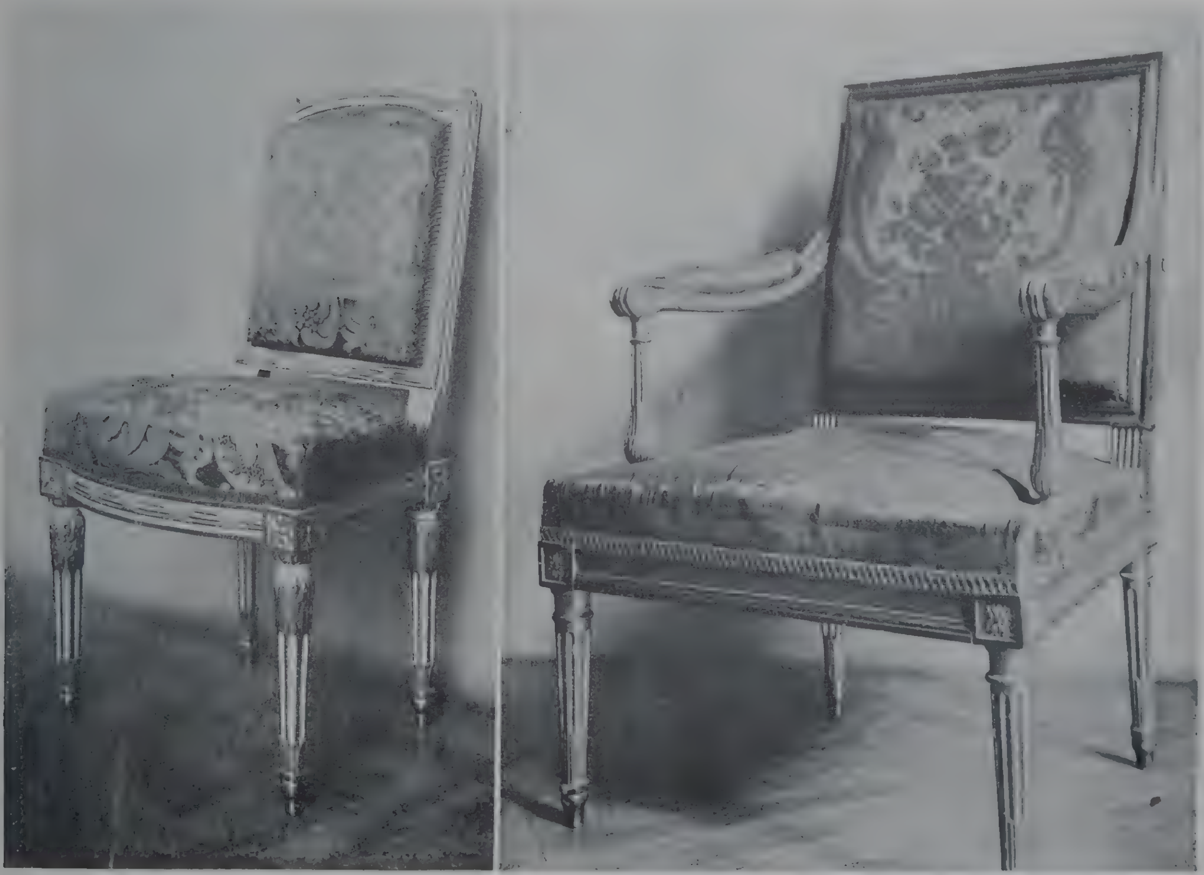
THERE is but little of the grandiose and theatrical pomp of Louis XIV, but little of the ornate Baroque spirit of the work of that period that is directly available for use in this country to-day. And only limited and very judicious use may be made of the exuberant and frivolous style of Louis XV to-day. The lessons of both schools of architecture are to be found, rather, in a cultivated appreciation of the largeness of concept and the bold manner of designing characterized by the first, and the versatility and brilliant audacity characterized by the second.

In the style of Louis XVI, however, is found a remarkably perfect thing, and a thing which synchronizes very directly with our own tastes and requirements.

The style of Louis XVI is the finished result of the intensive work of the architects of the two preceding periods, with certain added elements. Its basis of reason, and plan and alignment of parts, are the outgrowth of years of sincere academic conviction on the part of the more conservative of the French designers. Its classic quality is the result of final reaction from the Baroque and the Rococo, with strong contemporary interest kindled by new discoveries of classic remains. Having found the fountain head of inspiration which had fired the minds of Vitruvius and Palladio and other Italian Renaissance architects, the architects of France now turned to the actual monuments of classical antiquity instead of to old Italian books.

Other influences, more superficial, contributed to the development of the more detailed aspect of the style; but its fundamental traits were an almost inevitable result of what had gone before.

From the standpoint of interior decoration there are several essential points which should not be overlooked. Of these one of the most significant is that of *unity*—a point especially characteristic of the architecture, furniture and decoration of the period of Louis XVI. It has been said that "there has been in all the history of decorative furnishings no other period (and no other people) so conscious of the value of the ensemble as was eighteenth



Examples of Louis XVI Chairs from the Collection at Versailles

century France of the time of the Louis." Each decorative element, whether a wall treatment, a panel, a chair, a piece of fabric or a clock, was not only perfect in itself, but a perfect part of an entire scheme. The style was more consistent, more obviously studied than the work of any time since the period of Henri II. Baroque and Rococo excesses were abandoned, and there was an evident return to the sound principle of decorating construction instead of constructing decoration.

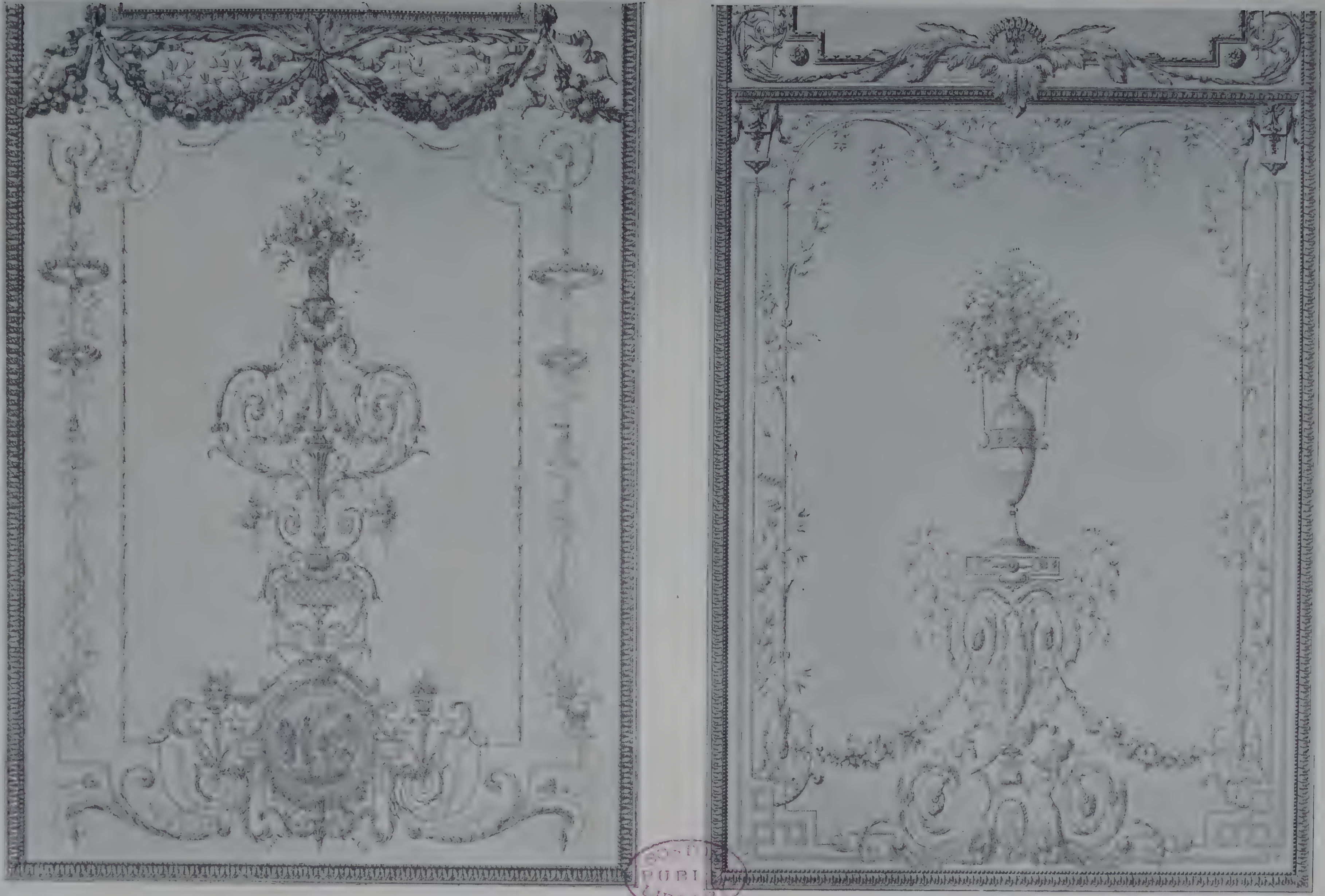
One reason for the adaptability of the Louis XVI style to use to-day lies in the fact that it is essentially the style of the *petit salon*, rather than of the vast and imposing interiors which were devised as settings for the pompous court affairs of Louis XIV. The small salon and the boudoir became even more popular under Louis XVI than in the preceding reign, when their popularity commenced.

The fineness in scale of the interior detail and the furniture of Louis XVI make the style especially adaptable for use to-day in the treatment of the reception room, the breakfast room and the small dining room, as well as the bedroom and boudoir. Another distinct quality which makes for the present-day utilization of the style is its similarity in feeling to the works of the master-stylists of Georgian England, especially the Brothers Adam.

The interior decoration and furnishing of the large modern hotel, an absorbing study in itself, has for many years leaned strongly toward the style of Louis XVI for inspiration, and in many examples of its use has shown that the fundamental "rightness" of the style, in its purely architectural sense, admits of a remarkable range for adaptation.

In the design of interiors, two principal kinds of detail appeared, but both were consistently treated, and both were subordinate to one great governing

Wall Treatment of a Louis XVI Salon, Palace of the Tuileries, Paris
From Designs by Lefuel



PANELS FROM THE APARTMENTS OF THE EMPRESS, PALACE OF THE TUILERIES, PARIS
FROM DESIGNS BY LEFUEL

characteristic, which was a combination of scale and alignment.

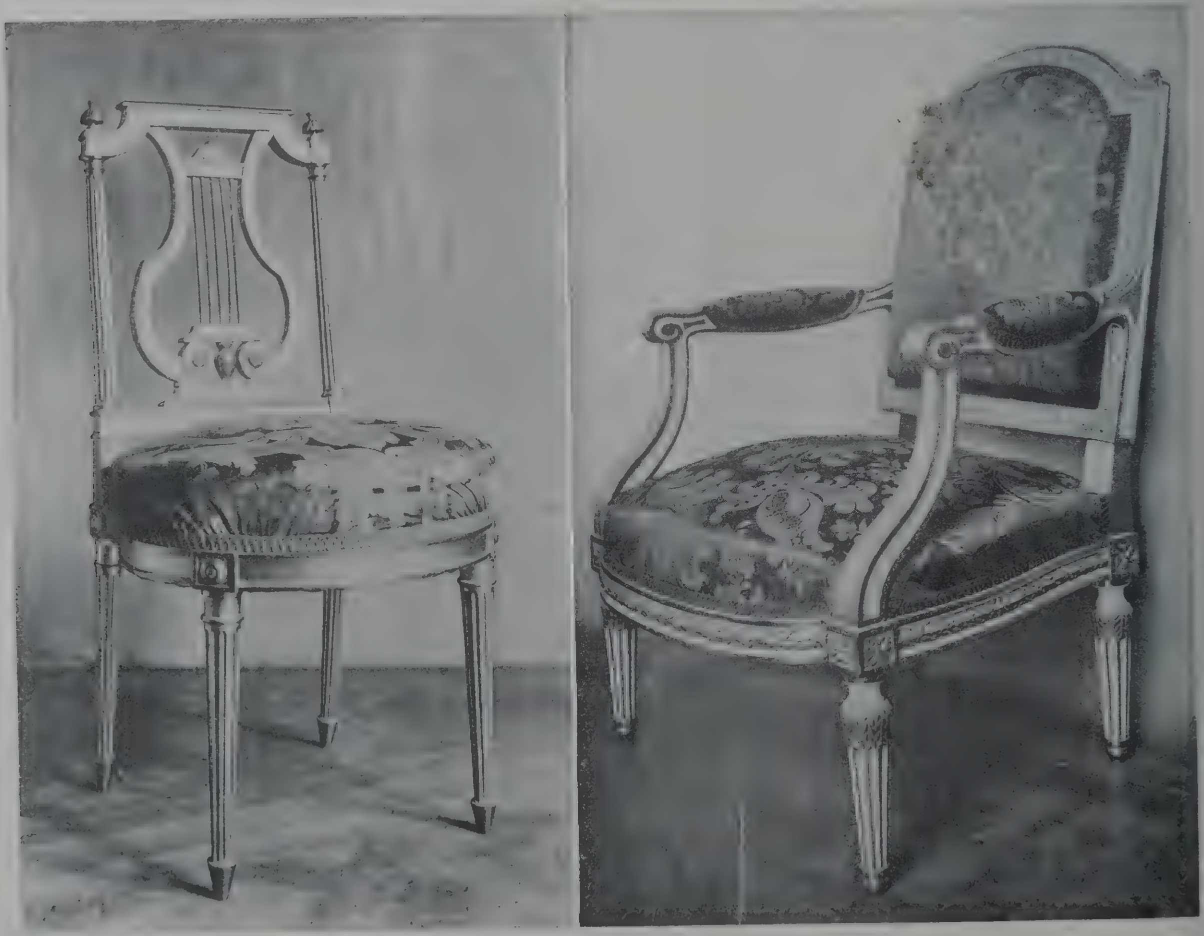
Gone were the fantasies in scale which made the Baroque element in French architecture as distressing as it was entertaining; gone the unsymmetrical madness of the Rococo element, which was as reprehensible as it was vivacious.

If one were to name only one salient merit of the style of Louis XVI, it should be the merit of studied nicety in scale, which made itself felt not only in the proportions of the larger elements of design, but in the smallest details as well.

These details, of two principal kinds, were virtually all subordinate to the characteristic paneled treatment of interiors, which divided wall spaces into harmonious units, breaking up the scale of a large room and effecting harmonious alignments with door and window heads, and with the different spaces to be dealt with in the whole room.

Fine mouldings, usually gilded, set off these panels, which, when not of plain painted wood, consisted of mirrors, paintings or decorative fabrics. Within tall, narrow panels, especially at the corners of rooms, appeared low-relief decorations, which often consisted of the "attributes" of the rustic whim of fashion, inspired by the "back to nature" and "simple life" writings of Jean Jacques Rousseau. It must have pleased the whimsical fancy of many a sophisticated court lady besides Marie Antoinette to have her salon embellished with decorative gilded groupings of wheat-sheaves, rakes, spades, shepherdess' crooks and farm baskets, entwined with graceful ribbons. And no less in accord with the romantic fancies of the period were the flaming torches, quivers of arrows and Cupid's bows, which so often formed the motif of the decorator.

The classic inclinations of the period were represented by sphinxes, griffins, lyres, bases and urns, the latter often flaming or sedately draped with finely modeled cloth swags. The classic element further appeared in the treatment of most Louis XVI mouldings and bands — such motifs as the egg-and-dart, the fret, the wave, the guilloche, the bound reed, and all manner of beadings, as well as the acanthus and the spiral scroll. In accord with classic precedent, wreaths were made up of oak, bay or laurel, which did not conflict, however, with the graceful floral swags and garlands appearing in much work of the period. These were characteristically executed with the utmost delicacy and refinement, and in fine scale



Examples of Louis XVI Chairs from the Collection at Versailles

OVERMANTEL AND DRAWING ROOM IN THE LOUIS XVI STYLE, NEW YORK CITY RESIDENCE

A. J. BODKER, ARCHITECT

with any composition of which they formed a part.

The typical fireplace treatment was singularly simple in comparison with the work of previous periods. The openings were kept low and framed by low mantels of wood or stone, the former painted and carved, and the latter also carved in fine detail, often with inserts of colored marbles. The mantel shelf was supported by consoles of classic form or by *termes*. The overmantel space was generally filled by a large mirror and, in the case of high ceiled rooms, a decorative panel was often introduced above the mirror.

Ceilings were restrained in design, and, in the latter years of the period, were flat, without coves, and quite plain with regard to surface decoration. In others architectural mouldings and decorated bands divided the space into symmetrical panels that conformed with the careful symmetry that was so characteristic of the wall treatment. When plaster decorations were used, they were frequently colored.

One of the most characteristic forms associated with the period is the ellipse, which is seen in the treatment of windows, mirrors, wall paintings and overmantels. Even the ellipse, however important as it is in so many Louis XVI decorative compositions, is, like all other curvilinear forms, subordinated to rectilinear forms. The ellipse was a favorite form for chair-backs, and exquisite tapestry coverings were woven to fit. The furniture, for the most part, was identical with the interior architecture of the period in design and scale and general feeling. Much furniture was gilded, and gray was a favorite color, while the highly decorative note was afforded by cabinets and consoles in the rich and elaborate marquetry and ormolu of Riesener. The characteristic lines of Louis XVI furniture were straight and slender: cane-work came into vogue as well as tapestry or brocade covered upholstery; but always there was a remarkable affinity between furniture and interior. Decorative fabrics and floor coverings were in character with the whole scheme, as, indeed, was every component part, including the costumes of those who originally devised the style as a fit setting for their gay and sophisticated life.

The color schemes of the period were delicate and subdued, consisting of cool, harmonious combinations of such colors as white, rose, pearl gray, light blues and greens, with richness added by means of a skilful application of gilding to mouldings and ornaments.

It is obvious that a style of such intrinsic nicety and perfection could never become obsolete, but must be destined to find an increasing appreciation as time goes on.

As Ward points out, "The style of Louis XVI constitutes one of the most homogeneous and least strained adaptations of classical architecture to modern requirements" — a characterization which gives much of the reason for its availability to-day.

Certainly the whole field of interior decoration has been inestimably enriched by the legacy of this era of eighteenth century France, which has given us a style so perfectly coordinated in its parts, and so expressive in its ensemble of an urbanity and a degree of civilization intensely worth perpetuating and carrying on.

Authentic Reproductions of Full- and Half-Width Textiles of the Louis XVI Period

Two Recent New York Churches

FROM THE DESIGNS OF BERTRAM GROSVENOR GOODHUE

By MATLACK PRICE

IN no type of building are the elements of tradition and precedent so insistent or so pervasive as in the church, and in none may these elements be made so powerful a factor in the achievement of a splendid and noble work of architecture. The church architect must have not only the practical ability and the spacious vision of the master builder, but the erudition of the scholar as well. With any one of these faculties alone, or even with but two of them, he must in all likelihood fail to achieve a really great church.

At the forefront of American church architects, Bertram G. Goodhue has long occupied a conspicuous position because he is not only an architect in the old sense of a "master builder" but in the essential attainment of a remarkable degree of scholarship in the field of church architecture, church details and ecclesiastical symbolism.

The extent to which Mr. Goodhue's attainments are developed must be apparent in even such necessarily brief notes as the following on two recent churches of his design, in the distinct styles which we know as Gothic and Romanesque.

THE CHURCH OF ST. VINCENT FERRER

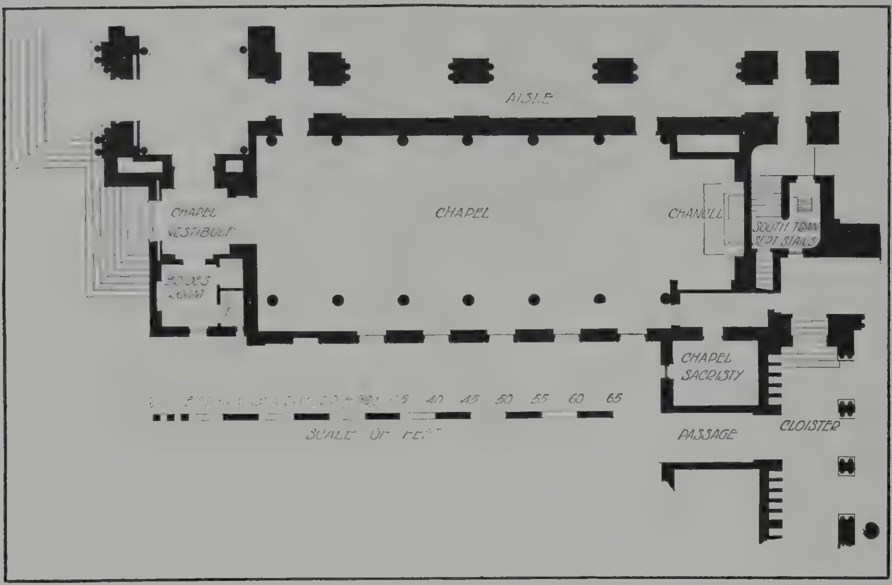
In planning and designing the Church of St. Vincent Ferrer, the architect had before him at once the creation of a church for a great and historic religious order — that of the Dominican Friars. In the design, therefore, lay the inspirational opportunity of expressing and incorporating the wealth of Dominican tradition and imagery, which is a fabric of seven hundred years' growth. In this respect it is far more than a mere church; it is a remarkable example of detailed religious history in which every provision has been made for carrying on the special forms of ceremonial which distinguish the Dominican rite from the Roman.

The Gothic style was regarded as especially appropriate for this church, as the Dominicans built the only Gothic church in Rome — St. Maria Sopra Minerva.

The exterior of St. Vincent Ferrer, not entirely unlike the same architect's treatment of the Chapel of the Intercession for Trinity Church, gives the effect of a square-topped façade, with a tall, steep roof. The St. Vincent roof of copper is recessed to provide a ledge upon which will be ranged statues of Dominican saints, effecting a continuity of the line of those already in place on the octagonal turrets.

The four great niches will contain statues of the four Dominican Popes, adding further to the already highly historical significance of the whole church as

Lady Altar in North Transept, Church of St. Vincent Ferrer



Floor Plan, Chapel, Church of St. Bartholomew

a history, in architectural terms, of the Dominican Order. The whole concept of the exterior combines dignity, and a sort of rich austerity with the utmost expression of special symbolism, as evidenced in the treatment of the west front.

Of this a more detailed description than is possible for the whole church may serve to show the extent to which this special symbolism has been developed throughout. "In the center of the tympanum is the image of the Patron — St. Vincent Ferrer, with the arms of the Order beneath. St. Vincent is flanked by St. Dominic, the founder of the Order, who, in turn, is flanked by his symbols of the dog and devil's head — and St. Francis, founder of the Franciscans with the symbols of the lamb and the wolf. The friendship of St. Dominic and St. Francis has manifested itself throughout the seven hundred years' existence of the two Orders. The arch itself is replete with foliage, symbolism and scenes from the lives of the three saints above mentioned. The arch label ends with two figures representing the Old and New Dispensations. St. Veronica, with the imprint of Christ's face, represents the New, and a partially veiled head represents the Old. Above each are shields bearing emblems of the Passion. Of course the crowning feature of all is the great Rood, very boldly chiseled (Lee O. Lawrie, Sculptor) — the first to appear on the exterior of any Catholic church in New York. Above the figure of Christ is a canopy supported by angels, and the emblems of Mary and John are boldly displayed on either side, with mottoes beneath."

In plan the Church of St. Vincent Ferrer is cruciform (about 221 feet in length) and oriented. The north transept is dedicated to Our Lady, since its door leads into the Lady Chapel, formed by the north aisle and transept.

One of the special provisions for Dominican ritual is seen in the exceptionally large choir, which makes the chancel longer than that of any Roman Catholic church in this country. The choir is somewhat narrower than the nave, due to the original expedient of building within the old walls, and, as in the case of many European churches which have undergone historic developments and evolutions, the resultant effect is very interesting.

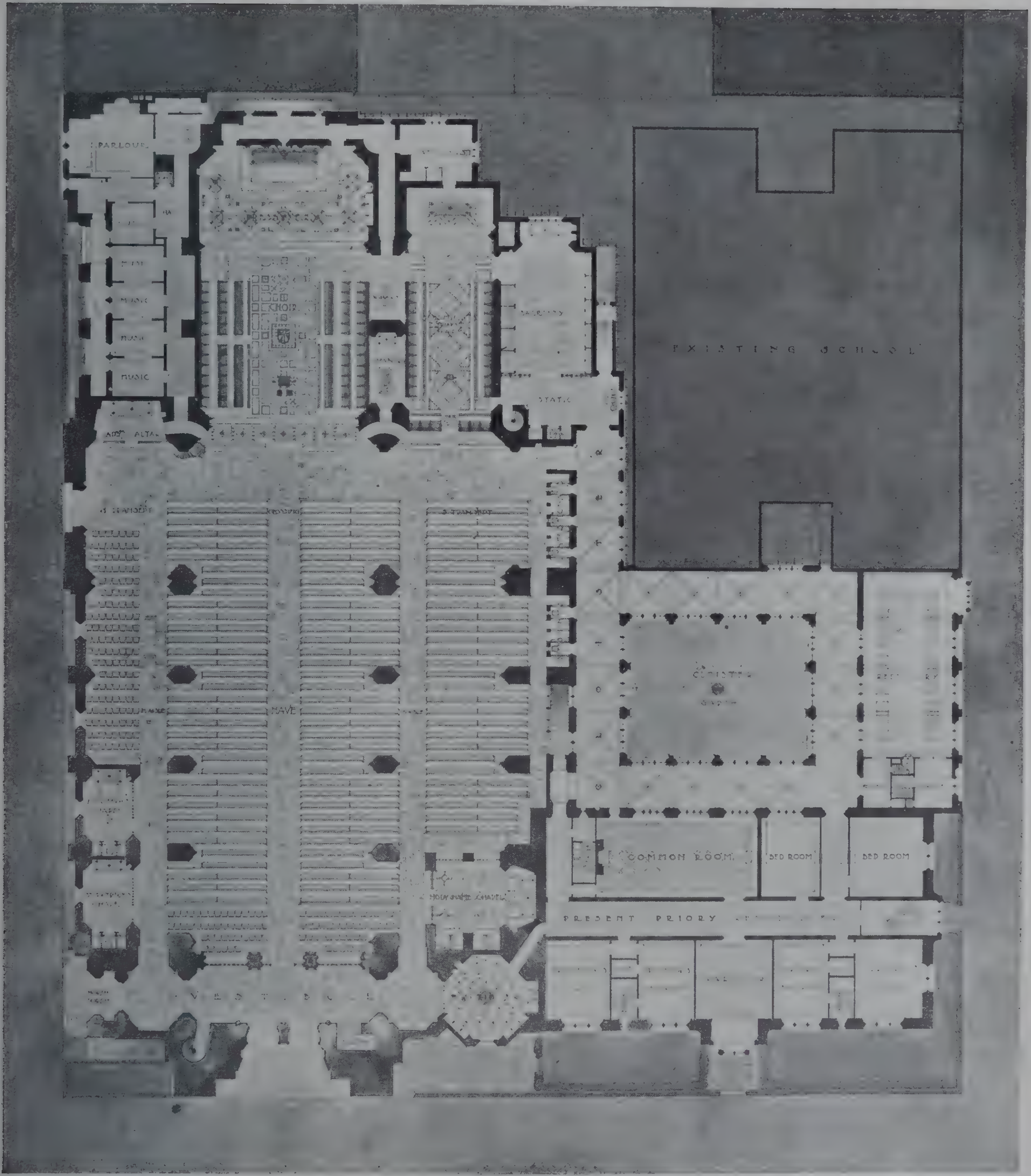
The nave is entered through a large narthex, to the south of which is the octagonal, vaulted baptistry in its traditional and symbolical position at the entrance, and distinctly apart from the church. To the east of the south aisle, and south of the church, is located the Friars' Chapel, which has its own stalls, organ, choir screen and loft, and in its whole effect the architect's intention was to suggest a medieval parish church.

The garth will be completely enclosed when the new Refectory is built and the old Priory wall is re-faced to conform with the other new work.

In matters of detail and equipment the church of St. Vincent Ferrer is unusually interesting, though many important things, such as the permanent high altar, the reredos and the pulpit in the Presbytery and the paintings of the Stations of the Cross are yet to be installed.

In every detail the most has been made of the ritualistic and historic symbolism associated with the Dominican Order, as for example, in the Rood Beam, which afforded Mr. Goodhue a fine opportunity to exercise his unique genius for reviving the rich splendor of Gothic polychrome. The great beam, supported at either end by stone corbels in the form of cherubim, is richly carved and colored and gilded, with symbolic figures and ritualistic texts in Latin, carved and emblazoned, with letters in red, gold and black.

In a church of such exceptional architectural merit as St. Vincent Ferrer, it is fortunate that the hand of the architect has been allowed to make its artistry apparent in virtually all the equipment and decoration, and that these varied things are all being specially designed and wrought. Although fashioned by able craftsmen, the architect made the designs for such important ritualistic



Floor Plan, Church of St. Vincent Ferrer

details as the Tabernacle and the hanging Pyx.

But mere details in themselves, no matter how interesting, constitute merely a categorical description — and a noble building, especially a church, is, or should be, an organic thing, full of meaning and inspiration to all who behold it. What, then, is the message of the Church of St. Vincent Ferrer, and of the powerful architectural personality that animates its design in structure and in detail?

From the church as a whole, viewed even under the disadvantage of distracting city surroundings, emanates a tremendous architectural quality of dignity. There is massiveness in the great buttresses; there is a fine sense of stability in the whole edifice. There is renewed evidence (not the first from Mr. Goodhue's hand) that the Gothic spirit is not dead; that the style is not a dessicated archeological thing, but a still living and growing organism.

ST. BARTHOLOMEW'S CHURCH

The architectural style in which this church is designed was dictated by the initial decision to incorporate in the new building the well-known Romanesque triple entrance portals from the old building: the manner in which the style is rendered reflects the vigorous and well-based architectural convictions of the architect.

Known for so many years as a designer of Gothic churches, and known, too, though less extensively, as a remarkably skilful designer in the style of the Spanish Renaissance, considerable interest was evinced by critical observers of contemporary architecture in what would be Mr. Goodhue's rendering of a large and important church in the Romanesque style.

It should be obvious that a finished opinion of the whole cannot be put forth when the great tower and cupola remain yet to be built, since this feature, when added to the present structure will dominate the composition. Without it we see but a portion of the architect's intention; as the building stands, it is but a portion of the architect's vision, and is, therefore, a better subject for the study of detail than of the larger relationships of its design.

The illustration of the main church has been left to a later date when the work will have reached completion and it can be presented in its entirety. The illustrations in this issue are of the chapel, which is the only part of the structure complete at this time.

The plan of the church is cruciform, and so disposed that the pulpit and lectern may be seen from every seat. The three aisles correspond to the three doors which give from the narthex into the church, these, in turn, being designed to conform with the triple entrance (west front) taken from the former building of the church at Madison avenue and 44th street.

The main body of the church and the transepts have great barrel vaults, and at the intersection four massive piers support four impressive arches, upon which rest the walls which form the lower story of the ciborium. In churches of the Romanesque type the form of central tower designed for future addition to this church is by no means usual, the most conspicuous precedents existing in St. Maria della Grazie at Milan and the Certosa at Pavia.

The feeling of the whole building, not only in its entirety but so far as it has been finished, is that of the Italian type of Romanesque rather than the French. Although the triple portal which determined the choice of Romanesque was based by McKim, Mead & White upon the doors of St. Gilles, in the south of France, the manner of its execution, as might be supposed, was distinctly Italian.

This beautiful doorway from the old St. Bartholomew's Church is better placed in the new building since it carries above it no heavy superstructure, but only the projecting front of the narthex. The architect, quite rightly feeling that it would be unwise to construct a design which would in any way tend to compete with or overshadow this famous door, kept its immediate setting restrained and largely unembellished.

Aside from the west front, the most conspicuous exterior features are the north and south transepts (especially the latter) and a very interesting arcaded porch on the north side, with beautifully designed Romanesque columns and entwined, interlaced capitals.

The south transept has a large rose window, seen in one of the plate illustrations, with small Romanesque columns of different colored marbles radiating like the spokes of a wheel, and much carved interlacement in the stone structure of the window. The corners of this transept terminate above in great figures of St. Bartholomew and St. Philip, and below the rose window is a projecting, arcaded porch — one of the lower masses of the building which, like the narthex, were designed to give greater scale to the main body of the church and the central towering mass of the ciborium.

In choosing materials for the exterior, the Romanesque style naturally called for a small unit and for a stone which would lend itself readily to intricate carving. For the latter purpose Indiana limestone was chosen, and for the body an unusually interesting orange colored brick, made in various sizes and proportions, so that the monotonous effect of regular courses was avoided.

These two materials were so disposed in the design as to effect a gradation from more stone than brick in the lower portions of the building, and more brick than stone in the upper portions.

The interior piers and arches, with stone and marble veneer over concrete, are detailed to conform with the large scale of the nave and transepts, while a more intimate and small scale treatment was possible in the chapel. Here the shafts of the columns from the old church were used, with newly carved capitals, supporting a trussed timber roof, gorgeously decorated in the polychrome manner of the roof of San Miniato, in Florence.

It is a noble project, not entirely finished, but giving every evidence in its broader aspects of planning, as well as in the imagination and imagery of its fascinating detail, that the architect is not an architect in one style, but in the larger sense of the word — a master builder — in whose hands a style is a means and not an end of expression.

EXTERIOR VIEW

CHAPEL, CHURCH OF ST. BARTHOLOMEW, NEW YORK, N. Y.

BERTRAM GROSVENOR GOODHUE, ARCHITECT

DETAIL OF ENTRANCE

CHAPEL, CHURCH OF ST. BARTHOLOMEW, NEW YORK, N. Y.

BERTRAM GROSVENOR GOODHUE, ARCHITECT

DETAIL OF CHANCEL

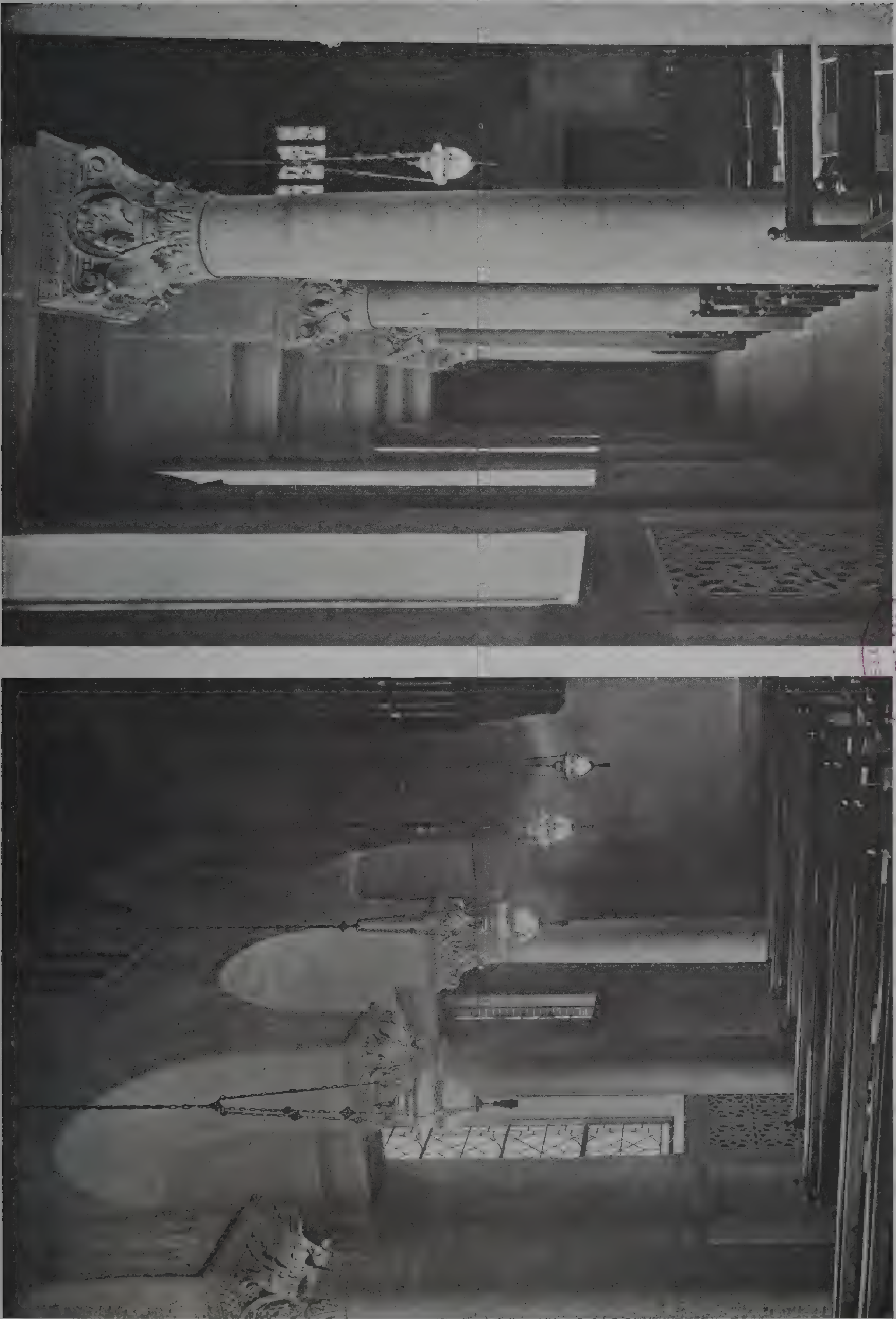
CHAPEL, CHURCH OF ST. BARTHOLOMEW, NEW YORK, N. Y

BERTRAM GROSVENOR GOODHUE, ARCHITECT

VIEW SHOWING ORGAN SCREEN

CHAPEL, CHURCH OF ST. BARTHOLOMEW, NEW YORK, N. Y.

BERTRAM GROSVENOR GOODHUE, ARCHITECT



DETAILS OF AISLE

CHAPEL, CHURCH OF ST. BARTHOLOMEW, NEW YORK, N. Y.

BERTRAM GROSVENOR GOODHUE, ARCHITECT

VIEW FROM LEXINGTON AVENUE

CHURCH OF ST. VINCENT FERRER, NEW YORK, N. Y.

BERTRAM GROSVENOR GOODHUE, ARCHITECT

MAIN ENTRANCE DOORWAY

CHURCH OF ST. VINCENT FERRER, NEW YORK, N. Y.

BERTRAM GROSVENOR GOODHUE, ARCHITECT

A specially drawn detail of this doorway was published in *The Forum* Collection of Gothic Details, August, 1918

VIEW OF CROSSING AND CHANCEL

CHURCH OF ST. VINCENT FERRER, NEW YORK, N. Y.

BERTRAM GROSVENOR GOODHUE, ARCHITECT

DETAIL OF TRANSEPT AND CHANCEL

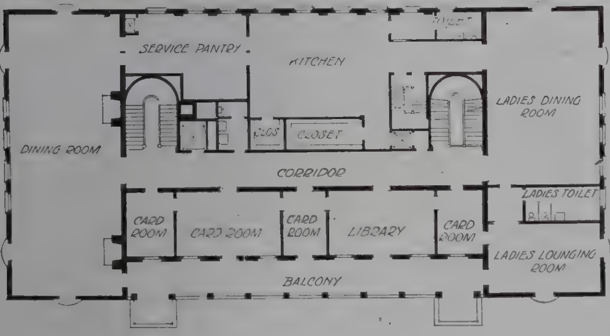
CHURCH OF ST. VINCENT FERRER, NEW YORK, N. Y.

BERTRAM GROSVENOR GOODHUE, ARCHITECT

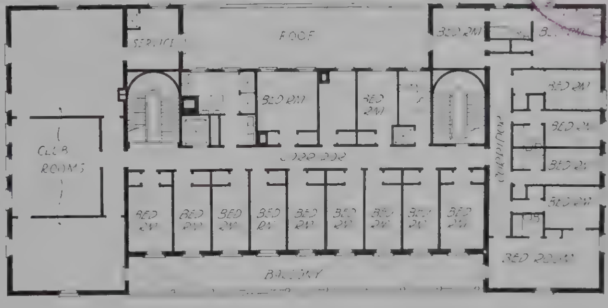
NAVE LOOKING TOWARD NARTHEX

CHURCH OF ST. VINCENT FERRER, NEW YORK, N. Y.

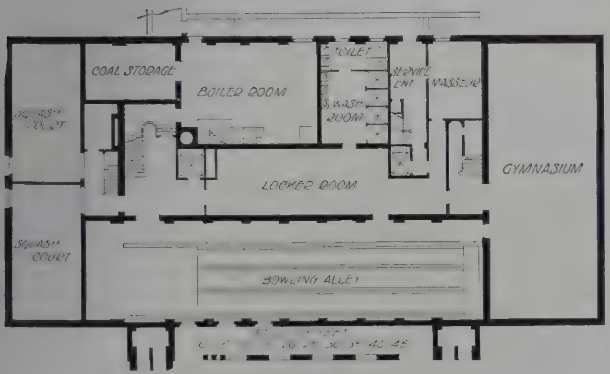
BERTRAM GROSVENOR GOODHUE, ARCHITECT



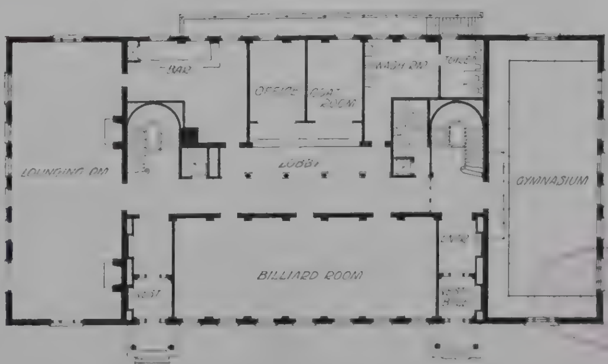
SECOND FLOOR PLAN



THIRD FLOOR PLAN



BASEMENT PLAN

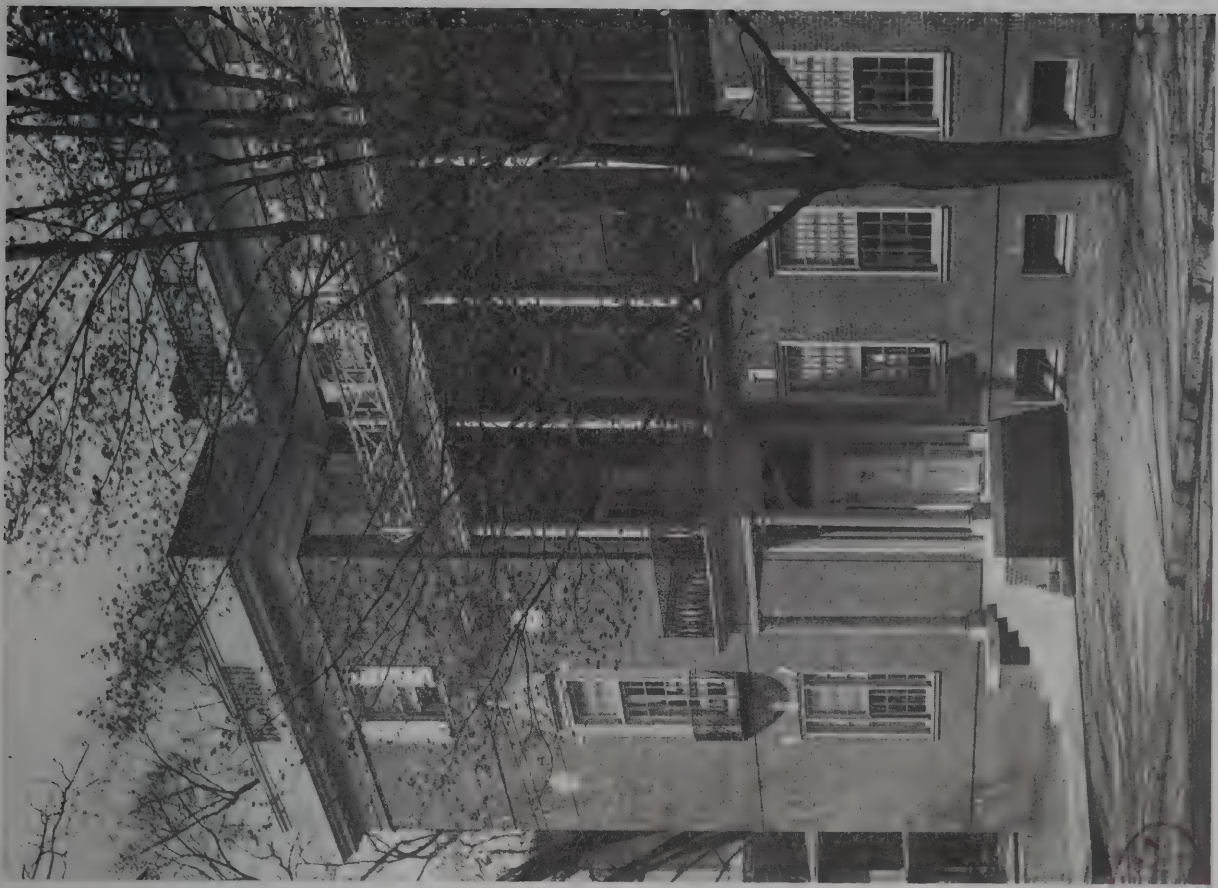


FIRST FLOOR PLAN

WATERBURY CLUB, WATERBURY, CONN.

CASS GILBERT, ARCHITECT

ENTRANCE DETAIL



DETAIL OF FACADE

WATERBURY CLUB, WATERBURY, CONN.
CASS GILBERT, ARCHITECT

VIEW ACROSS MUNICIPAL PARK

FIRST FLOOR PLAN

OFFICE BUILDING OF CHASE COMPANIES, INC., WATERBURY, CONN.

CASS GILBERT, ARCHITECT

DETAIL OF CENTRAL FEATURE

OFFICE BUILDING OF CHASE COMPANIES, INC., WATERBURY, CONN.

CASS GILBERT, ARCHITECT

DETAIL OF WEST WING

DETAIL OF ENTRANCE

OFFICE BUILDING OF CHASE COMPANIES, INC., WATERBURY, CONN.

CASS GILBERT, ARCHITECT

CONFERENCE ROOM

EXECUTIVE OFFICE

OFFICE BUILDING OF CHASE COMPANIES, INC., WATERBURY, CONN.

CASS GILBERT, ARCHITECT

Two Buildings at Waterbury, Conn.

CASS GILBERT, ARCHITECT

OFFICES OF THE CHASE COMPANIES, INC.

A FEW years ago there was erected in Waterbury, Conn., a city hall from the design of Cass Gilbert, architect, that has proved a most successful building. On the completion of the city hall the property opposite was occupied by an undignified brick dwelling and a one-story block containing a garage and an undertaker's establishment. Adjacent to the new municipal building was the Bronson Library and Library Park.

The late Henry Sabine Chase, president of the Chase Companies, Inc., and a public spirited citizen, conceived the idea of a civic improvement and purchased the property facing the city hall. The undesirable buildings were razed, and Mr. Gilbert was engaged to design a building to house the administrative forces of the several organizations comprising the combined Chase Companies.

The general characteristics of style and detail, the accented lines of height with crowning balustrade and a similar lower story with flat headed windows in the reveals of a rusticated arcade, are carried out in the new facing building. As a balance to the wide entourage in front of the municipal building, the Chase structure stands well back on a flat lawn with a deep-set central façade between projecting wings.

The main entrance approached over a wide paved walk carries circulation east and west from the foyer and principal stair hall through middle corridors to the wings. The first floor is occupied largely by the offices of the parent organization — The Waterbury Manufacturing Company. The entire wing on the right end is taken up by the purchasing department of the combined Chase Companies, while the main front is given to reception or conference rooms. There are elevators to all floors and four stairways to the second story. On this floor are located the offices of the president, treasurer, secretary, managers and sales and production department of two of the companies, general filing room and a large conference room. On the third floor, reached by two stairways at either end, are the combined accounting departments, the records department, cashier and pay department, with their vaults, and the cost and compensation departments. The fourth story front is slightly back of the main façade line and does not extend over the area of the wings. This floor is mainly devoted to welfare work, although photographic equipment occupies some area.

The exterior of the building is Indiana limestone, with grilles, lamps, balconies and surrounding fence of iron. The interiors are simply treated with elaboration of detail only at principal points. The floors of the first and second story hallways are of Tennessee marble. The main door trim, stair rail, radiator grilles and fixtures are bronze. In the private offices of the administrators, mahogany finish and paneling are used. The large working spaces are finished in enamel with simplest detail, giving the maximum in sanitation.

View Across Entrance Court of Chase Companies' Offices

Vestibule, Chase Offices

THE WATERBURY CLUB

WHILE a comparatively small establishment, this clubhouse ranks with the finest of its kind throughout New England in its plan and appointments.

It is located on the edge and overlooking Waterbury's historical green and carries in its façades a note of the more pretentious Colonial examples of this section of the States. The details of exterior and interior are quite decidedly the Georgian architecture of the colonies — notably the doorways, the attenuated porch columns, the type of brickwork, and the mantels and trim within. The main façade, aside from being ideal in its conception for club purposes, is fortunate in never lacking interest.

On entering by either front entrance a corridor parallel with the front leads to a central lobby and office. On the left and right at the rear are the bar and toilet facilities. On the front of the building between entrance halls is a large billiard room, and at either end, each occupying an entire side, are the lounging room and the upper part of the gymnasium. A curving stairway opposite each entrance leads to the upper floors.

The second floor has two dining rooms at opposite ends — that at the right with adjacent rooms being for the use of ladies. The rear of this floor is given to the kitchen and service department, while at the front of the transverse corridor are card rooms and a library opening on to a balcony.

The third floor is entirely devoted to bedrooms, and the fourth floor is occupied by the steward's apartment and employee's rooms. In the basement, besides the heating plant and gymnasium with its lockers, there are two squash courts, a bowling alley, baths and a masseur's room.

The members' common rooms depend upon moulded surfaces for their embellishment, with the exception of a sparing employment of Adam ornament. The deep cornices, tall Doric columns with plain shafts, and modest trim, all present an atmosphere of comfortable, dignified repose.

Municipal Building, Waterbury, Conn.
Cass Gilbert, Architect

The Automobile and the Private Estate

PART I. THE EFFECT OF AUTOMOBILES ON ROADWAYS AND FORECOURTS

By TYLER STEWART ROGERS

THE last quarter century has witnessed the most remarkable modification of social and economic life by a mechanical invention of man that the world has yet seen. It is very reasonable to doubt whether another invention will ever exert the universal influence which the automobile has had on the history of civilization. Practically every phase of our social existence has been modified by the development of the automobile, and some have been almost revolutionized.

Changes have come so rapidly that many necessary or desirable modifications of existing conditions have not yet been recognized, and we have been satisfied with makeshifts for a number of years. This has been largely due to the constant changes in automobiles themselves, which until recently have been so numerous as to make questionable the stability of the present character of motor vehicles, and to make their ultimate character a moot question. Naturally fundamental changes in the design of buildings and roadways for automobile use have always lagged behind and will continue to do so until people are convinced that the design of motor vehicles has reached a point where future developments will not greatly modify their requirements as to space and road character.

The recent war has done much to convince people that the automobile as now developed is practically stable. Under pressure of military necessity, mechanical inventions were perfected to their utmost, and wonders were achieved in many branches. Aviation moved ahead very swiftly, yet automobiles changed but very little in their fundamental character. It is interesting and significant to note that the perfection of motive powers for aviation purposes did not materially alter the character of motive powers for automobiles. This has been sufficient proof to many people that the present design of motor vehicles is stable, and that although many improvements are still possible, there is little probability of their greatly affecting the character of the vehicles as we know them to-day.

The time has come, therefore, when we may consider how greatly automobiles have affected our lives and our structures, and we may now move with some assurance towards making desirable modifications of our structures (our lives seemingly having adapted themselves unconsciously) to further the convenience and usefulness of this new method of transportation.

The success of automobiles has increased the popularity of suburban homes and country estates by making them more accessible to each other and to the cities. The reverse is not entirely true, that the growth of estates has fostered the development of the automobile, for large estates have existed since pre-Roman times, and their popularity and numbers showed no marked increase until after the automobile became a practical vehicle. The two owe much to each other, nevertheless, and hence it is strange that estate design has not recognized the requirements of automobile traffic and storage more rapidly.

Automobiles have certain well defined characteristics common to all makes. The largest automobile is only about one-third its length longer than the smallest car. The gauge of all passenger cars varies only an inch or two, and by far the greatest number are all of one dimension. The overall width of all pleasure cars is very nearly the same. Few cars exceed 8 feet in height, and yet practically all enclosed cars require at least 6½ feet or more clearance. The greatest variations in automobiles come in their weight and in their turning ability; but even here the extremes only vary about 100 per cent, and the minimum figures have little effect on the design of roads or garages. Finally, all automobiles turn in the same manner and increase their gauge on corners in about the same proportion to their wheelbase.

Driveways, modified or designed for automobiles, have curves of long radius, and the curves are not "blinded" by the presence of obstructions to a clear view for a considerable distance. Higher traveling speed and greater inertia than horse drawn carriages require that the driveways be designed for greater safety. Entrance gates are now set well back from the public road associated with some form of entrance court permitting a junction of the private driveway and the road, having curves of very liberal radius. Forecourts or other forms of turn-around for automobiles are of greater

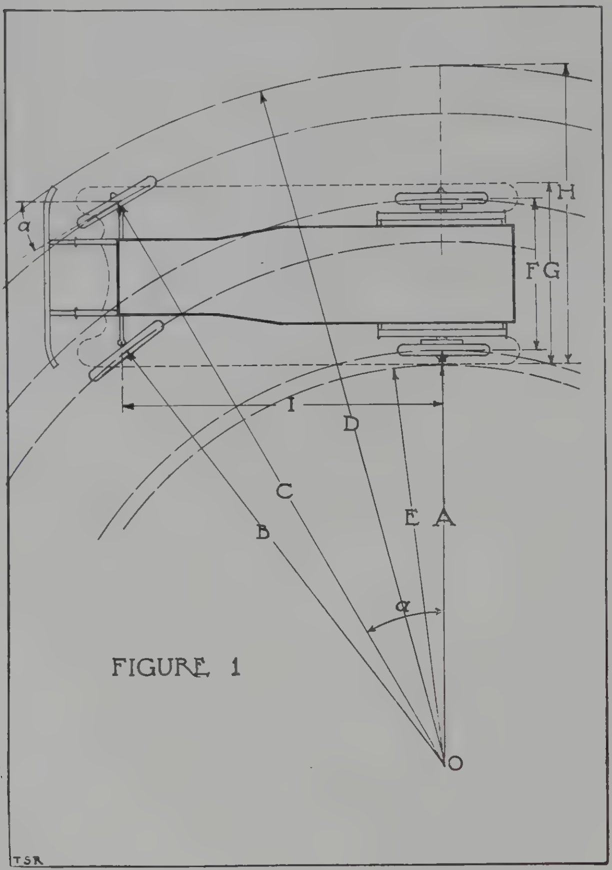


FIGURE 1

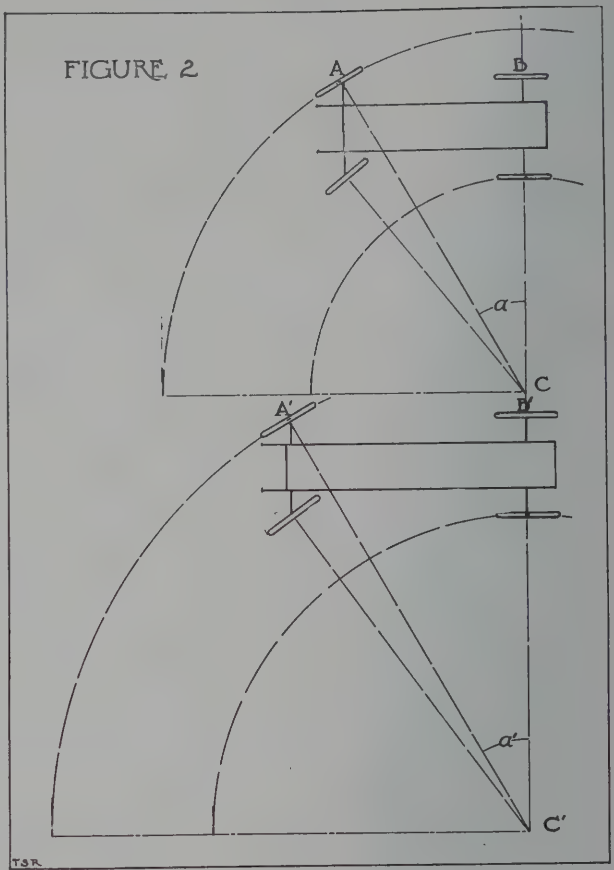


FIGURE 2

size than formerly, because the turning ability of motor cars has established fairly definite minimum dimensions and economical shapes which are greater than those required in earlier days.

Service areas, which include areas adjacent to the service portion of the house used for the delivery of supplies, as well as areas adjacent to the garage, stables, or other service buildings, have been similarly modified by automobile developments. In this case, however, the requirements of the light delivery motor truck are paramount for house service courts; while passenger vehicle requirements generally govern service areas at the garage. Heavy truck requirements need not be considered in estate design except in the width of gateways, the clearance of overhead obstructions, and the strength of bridges, for otherwise these trucks enter an estate so seldom as to make other special provision for their extreme dimensions a needless expense.

The garage is a feature introduced by the automobile itself, hence it is to be expected that garage design should by now have reached a fairly high degree of refinement. On the contrary, garage design still leaves a great deal of room for improvement, notably in matters of doors, ventilation, drainage, heating and equipment. Most of the problems have been solved, but both architects and owners have overlooked the importance of many of the improvements—the former for no apparent reason, and the latter because they fear there is great expense attached to refinements.

Automobiles have introduced another feature not hitherto recognized as a unit in estate design; namely, the parking space. Entertainments at country estates are frequently on a fairly large scale. Locations remote from public garages, public parking spaces, or from the guests' own estates, make essential some provision for parking the guests' cars during entertainments. Remote locations increase this necessity because the automobile has almost entirely displaced the electric car and the train for transportation to such functions, even when they are readily accessible.

In studying the actual effect of automobiles on estate design, it is of primary importance to understand the automobile itself, and how it differs from animal drawn transportation. Briefly stated, the major difference is entirely concerned with the turning ability of the motor car.

The front wheels of an automobile do not turn with their axle about a king-bolt and fifth wheel as in the case of carriages, but turn on pivots at the ends of a fixed axle. Figure 1 is a diagram showing this method of turning. The center of the curve described is approximately on line with the line of the rear axle extended. The front wheels described two circles of different radii) B

and C, Fig. 1), and hence the angles they form with the line of the body are different. This difference in angle is provided for in practice by a peculiar relation of the steering knuckles based on what is known as a modified Jeantaud diagram. Similarly, the rear wheels describe circles of different radii which is provided for mechanically by the use of a differential. All four wheels, therefore, have different radii from the common center, the extremes being the radius of the inside rear wheel (A, Fig. 1) and the radius of the outside front wheel (C, Fig. 1). It should be especially noted that the difference between these extremes (H) is considerably greater than the gauge of the wheels (F). Hence an automobile, while turning a corner, requires a wider roadway than when moving in a straight line. The normal track or gauge of automobiles is 56 inches, while the extreme track width on curves of minimum radius varies between 7 feet and nearly 9 feet — a matter of considerable importance where minimum road width is required. Furthermore, the actual clearance of all parts of the automobile from the fender on the inside to the bumper or other projection at the front on the outside (as at D, Fig. 1) is considerably greater than these figures.

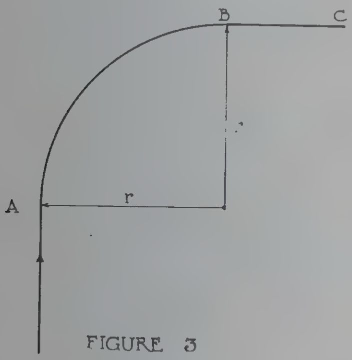


FIGURE 3

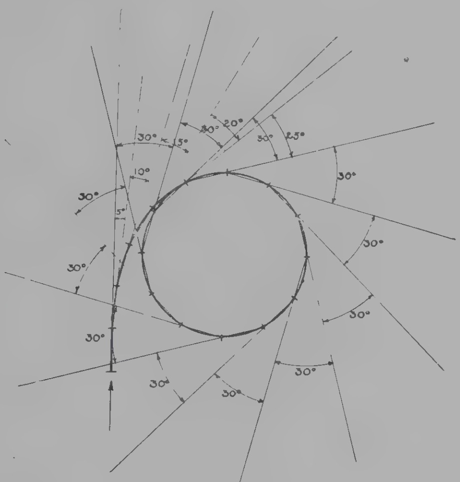


FIGURE 4

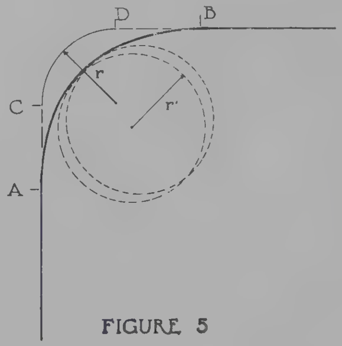


FIGURE 5

Inasmuch as the maximum angle which the front wheels form with the center line of the body is limited by mechanical difficulties, such as width of engine frame and the design of the steering mechanism, the turning ability of automobiles is governed mainly by the length of their wheelbase. A car of short wheelbase can turn in less space than a car of long wheelbase, and takes correspondingly less width of track on the curve, as shown in Fig. 2. This diagram shows two automobiles drawn to the same scale, one having a wheelbase of 100 inches and the other having a wheelbase of 132 inches. The angle which the outside front wheel makes with the line of the body is the same in both cases. The angles a and a' being equal, the triangles ABC and A′B′C′ are similar, and, therefore, the lengths of the sides are proportional. Hence for equal maximum angles of the front wheels the minimum turning radius is directly proportional to the wheelbase (allowance not being made for the slight errors resulting from the movement of the wheels about their pivots).

Entrance driveways and other roads of limited width should, therefore, be made appreciably wider at turn-arounds and on curves of short radius when there is any possibility of two cars passing each other at such places. A road surface only 6 feet wide is sufficient for a good driver to keep to on straight runs, but all the skill in the world will not keep a car on a 6-foot surface at a sharp turn.

The curve described by an automobile is seldom the arc of a circle—a fact frequently overlooked in the design of roads and turn-arounds. The arc of a circle requires a constant radius throughout the movement, which would mean that the front wheels (and hence the steering wheel) would have to be held in the same position throughout the curve. To accomplish a circular curve such as is shown in the diagram (Fig. 3), the driver would have to come to a full stop at point A (the point of curvature) and there turn his front wheels the required amount to produce the curve of radius r. At point B the car would again be stopped, the wheels straightened out, and the car started again on the line BC. Such procedure is, of course, ridiculous, yet it is worth emphasizing because so many designers use their compass with very little thought in laying out road curves.

The curve actually described by an automobile making a turn in one direction is similar to a parabola or the "transition spiral" of railroad engineering. It is seldom a mathematical curve in practice as the driver does not turn his steering wheel in any fixed relation to the speed of his machine. Were the steering performed by a mechanical process so that the degree of curvature

increased an equal amount for each unit of distance covered by the machine, a curve such as shown in Fig. 4 would be described. When the maximum angle of the front wheels was reached the car would thereafter proceed in a true circle. For purposes of illustration only this diagram was developed by assuming that the outside front wheel was turned 5 degrees to the right in each unit of distance through which the automobile moved. A maximum angle of 30 degrees was assumed. This figure illustrates the type of curve which all automobiles describe in their movements; hence a curve of this character should be used in the study of road design instead of using the arc of a circle.

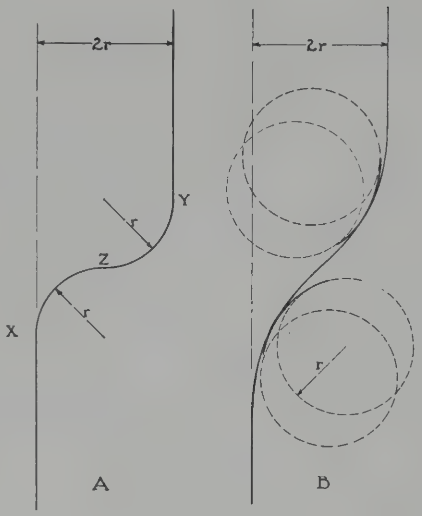


FIGURE 6

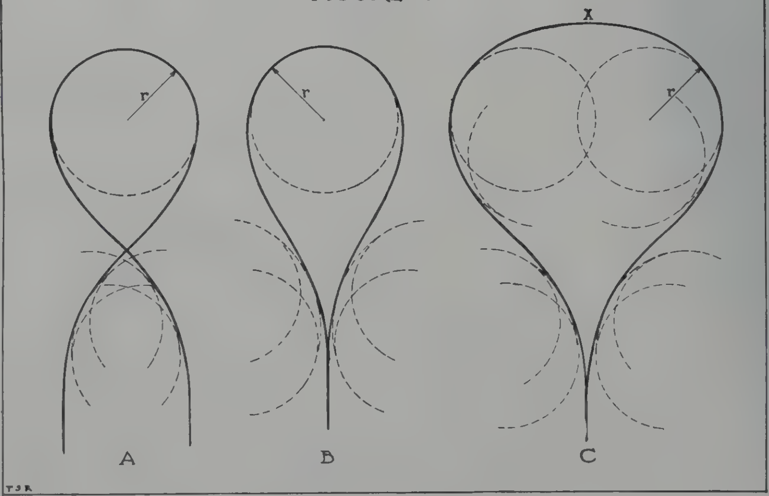
Figure 5 shows this curve used twice to produce the shape of the path of a car turning between two tangents at right angles. At A the driver begins to turn his steering wheel, continuing the movement to the center of the curve and then reversing the movement steadily until point B is reached. The dotted circles show the complete curves taken from Fig. 4. It should be noted that unless a process is followed such as described for Fig. 3, the curve of minimum radius is not quite reached while making a 90 degree turn. For comparison a turn of minimum radius throughout is shown at C-D in Fig. 5.

Reverse curves have also been badly designed because of the same fallacy in the minds of designers that automobiles describe arcs of circles. A curve similar to that shown in Fig. 6 at A is open to the same objection that was developed in the case of Fig. 3, with the added difficulty that at point X the driver would have to turn his wheels from their extreme angle to one side to their extreme angle towards the other side. At B in Fig. 6 is shown a reverse curve of the type normally described by a car making a crossover of the same distance. Parts of four units are used to develop this curve. Other reverse curves are possible to an infinite number, depending on the degree of movement which takes place before the reverse process sets in. It must be remembered that if an angle of say 15 degrees is reached to the right, the process must be reversed through 0 degree to 15 degrees to the left, there being a point of straight travel between the parts of the curve. Figure 6A provides no such transition.

Since the turn-around is the principal problem of estate designers, the curves shown in Fig. 7 are of especial moment. At A is shown a turn using the minimum radius *r* as the outside limit of the roadway. The result is a crossover. At B is shown a turn using the same radius as far as possible, but returning to the original line of travel. This figure shows that the automobile requires a space somewhat wider than its turning radius would indicate to make a complete turn. At C is shown a turn frequently required in forecourts where it is desired to stop at a doorway or at steps at the head of the curve X. In order to bring the car close to the curb it must straighten out as much as possible, which movement requires a total width of turning space nearly four times the minimum radius.

These curves are plotted mathematically without reference to actual dimensions and, therefore, are to be considered only as diagrams. By changing the ratio between the speed of travel and the rate at which the degree of curvature is inscribed, curves of infinite variety may be produced. These ideal curves are the basis for the best design for actual practice, for they involve a regular rather than an erratic movement of the steering wheel to negotiate them. It is easier for a driver entering a forecourt for the first time to steer his car with a smooth movement than to judge the erratic swing necessary to accomplish a poorly designed turn.

FIGURE 7



Heating and Ventilating

PART II. VAPOR SYSTEMS

By C. W. KIMBALL

THE simplest system of vapor heating is the one that has a supply valve on each radiator with only a union elbow on the return of the radiator, the supply valve being adjusted to the amount of steam its radiator will require. In this way each radiator is supplied with only enough steam to fill it, allowing none to go into the return, and thus only water of condensation and air escapes through the return and vent pipes to the boiler or atmosphere. The success of the system depends on the proper regulation of the supply valves and the proper pitch and dripping of the piping system. If the supply valves are not properly regulated, steam will go out into the return pipe and prevent other radiators from heating properly.

In any vapor system, hot water type radiation should be used with the steam supply at the top or bottom of the radiator and the return from the bottom at the opposite end. The radiation should be figured 20 to 25 per cent larger than for pressure steam systems, and the supply pipes should be planned to be large and evenly graded with the flow of steam and water, with no pockets, and should be dripped often enough to prevent any water or air accumulation. The returns should be run at a true pitch and should be 3 or 4 feet above the water line of boiler if possible. (See Fig. 1.)

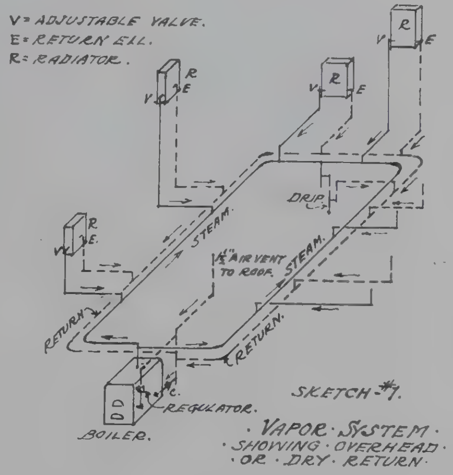


Fig. 1

If the returns are near or below the water line of the boiler, an additional air-vent line, 1 inch or 1¼ inch in size, should be put in above the water line and connected with each return coming down from above and should be carefully graded upward to vent the system to the atmosphere. (See Fig. 2.)

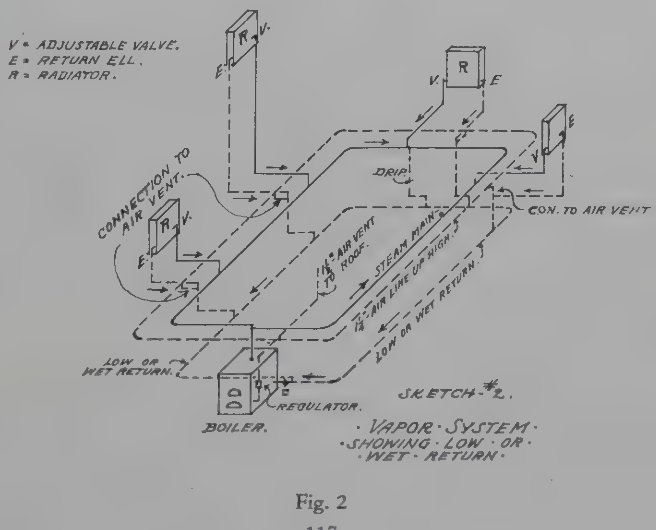


Fig. 2

Other vapor systems have the same general piping scheme and radiation, but have non-adjustable supply valves and include either a water seal, thermostatic or float trap, or a weighted check valve on the return connection of each radiator to permit air and water only to pass into the return system with air-vent pipes to the atmosphere. Some systems have a vapor-vent plug (a brass plug with a very small hole through it) in each radiator to assist in freeing the system of air. Other systems have special return valves which will allow air and water to escape from the radiators to return pipe, this return pipe being vented to the atmosphere and having a special vent valve which allows air to escape, but does not permit the air to draw back into the system as the steam condenses. This feature makes possible, at times, 6 inches to 10 inches of vacuum on the entire system, thus tending to make vapor leave the heater at a temperature of water less than 212 degrees and to heat farther than is otherwise possible.

Vapor systems are especially adapted to residences, small schools, churches, hospitals and other buildings where heating demands are not too extensive.

Vented Return Modulation System

This system is piped and equipped the same as the vacuum system described below and having the same supply and return piping as the vacuum system, with a graduated action supply valve preferably at the top of each radiator and a vacuum valve or trap on the return connection from each radiator and each drip.

The return piping system carries air and water back to a point near the boiler or receiver where the returns are vented to allow the air to escape.

If it is desired to carry two or more pounds steam pressure on the boiler and on the supply system, the

returns having no pressure must be put back into the boiler through some automatic device such as return traps, pumps or alternating receiver as, due to the design of the system, the pressure on the boiler side at this time is greater than on the return system, and the water obviously cannot return to the boiler by gravity.

This system is used many times on large buildings of all kinds where something more positive is desired than the regular vapor system and where vacuum pumps do not seem to be required.

Low Pressure Steam Gravity Return System

This heading covers a heating system, the main parts of which are boilers, steam flow and return mains, radiators with shut-off valves on each radiator connection and with air valves on each radiator coil, or indirect.

The variations of this system are:

1. One-pipe circuit system: a system in which there is only one pipe, this pipe being the supply and return combined, extending around the building below the radiation with one-pipe connection to each radiator. With this system the combined steam and return main is extended to a point beyond the extreme radiator and connected to a return main, which is carried to a boiler, trap or other outlet.

2. One-pipe down feed system: a system in which the steam main is in the attic or above the radiation and the various supplies to radiators drop down through the building with a single connection to each radiator, the pipe then extending to the basement. The steam flows into the radiators through this pipe and the condensation flows back through it. The bottoms of these drop risers are connected together into a return pipe which runs back to boiler or other source of heat.

3. One pipe underneath feed system with a basement return: a system of heating having a supply main in the basement with one-pipe risers up to radiators with only one connection to each radiator. In the basement each of these risers is dripped and these drips are connected together to the return main to boiler or source of heat.

4. Two-pipe underneath feed: a system where the steam and return mains and risers are separate and independent, with the supply connected to each radiator and a return connection taken from the return end of the radiator down to the return main in the basement, each radiator thus having a supply and a return valve and also an air valve.

5. Two-pipe down feed: a system where the steam mains are in the attic, on the roof, or elsewhere above the radiation, and the steam pipes drop and feed radiators; while the return risers start at each radiator and connect together in the basement. The drop steam risers are also dripped below the last radiator connection into the return main. There are air valves on each radiator.

6. Three-pipe system: a system having the same principal parts as Nos. 4 and 5, and, in addition, an air valve on each radiator connected into air-vent risers, which drop to a main extending entirely or partly around the building and which carries the vented air to the atmosphere.

Gravity steam systems are adapted to most, if not all, classes of building work, if properly designed.

Paul System

Briefly stated, this system is the same as the No. 6 described above, having the air valves connected together into an air main and this pipe extended back to some central point where some form of pump or other exhauster is installed, to draw the air out of the radiators through the air valves and air line and by this suction hasten the circulation of steam throughout the whole system. Each air valve used on this system is designed to be adjusted to allow the air to pass through and to shut tightly by expansion when steam strikes it.

Vacuum System

This system has the same main features as the gravity steam systems with the steam and return distribution approximately the same as the two-pipe low pressure steam system, but having the return connection from each radiator and each drip point equipped with a vacuum valve or steam trap, this device designed so that water and air only can pass through it on into the return, the valve closing automatically when steam strikes it. From these valves the returns are collected and extended to a pump which is designed to create a suction on the return piping, thus drawing to the pump all water of condensation. The pump delivers the water to the boiler or to a receiver after separating the water and air.

The vacuum system does away with all air valves, makes possible smaller steam and return mains, especially in large systems, and in cases where exhaust steam from engines is used the back pressure in the engine cylinder is reduced. The system makes possible the partial heating of any radiator, prevents to a great extent snapping and cracking in the piping and radiation, and makes possible placing radiators below the main return line of the system if desired.

Vacuum systems are adaptable to almost all large heating propositions which occur.

Italian Renaissance Details

A COLLECTION OF MEASURED DRAWINGS BY WILLIAM D. FOSTER

THE detail of the Broletto at Brescia is of one side of the courtyard. The main parts of the building were built during the thirteenth century, including the very fine Gothic tower. The latter part of the sixteenth century one side of the court was built up with the arcade on the first story and a colonnade above as shown in the detail, forming an entrance to a group of rather monumental rooms which are in active use to-day as the quarters of the courts of justice.

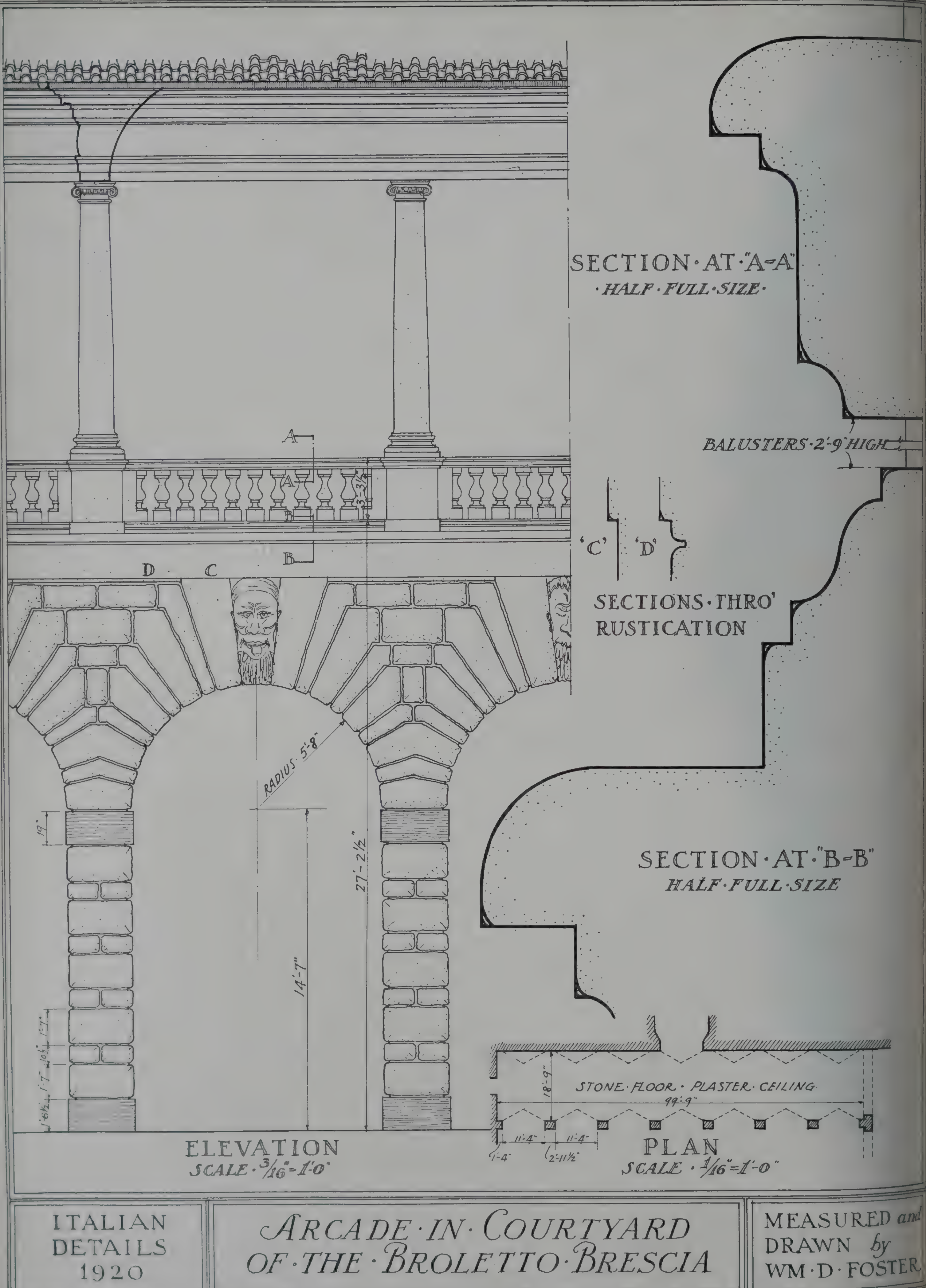
The finish of the stone piers and arches is particularly successful, the bases and impost blocks having a definite horizontal tooling, while the rest is a picked surface, the piers being rougher than the arches. The color of the stone is a warm brownish cream while the stucco above is a dull orange.

The motif from the Boboli Gardens is found in the amphitheater, which is directly behind the Pitti Palace, or royal residence in Florence, the long axis of the amphitheater being a continuation of the axis of the entrance of the palace. The amphitheater is elliptical or rather U shaped, the open end facing the rear façade of the building. A fine obelisk and a Roman sarcophagus have been placed near the foci of the arena. The amphitheater was formerly used for various festivals and pageants. The seats, or gradients which follow the U shape, lead up to a balustrade which is interrupted by the niche motif presented here. The particular beauty of the amphitheater is the silhouetting of these motifs in their warm cream stucco, quite spotted with lichen, against the background of the green of the garden. This forms a very interesting progression from formality to informality. Directly behind the architecture is a high hedge of trees well trimmed to give a deep, sharp shadow ; behind this formal clipped line come some more or less formal trees, giving rather vertical lines ; while finally back of these is the very informal massing of rough foliage, altogether one of the finest combinations of architecture and planting possible.

This amphitheater is open as a public park.

Courtyard of the Broletto, Brescia

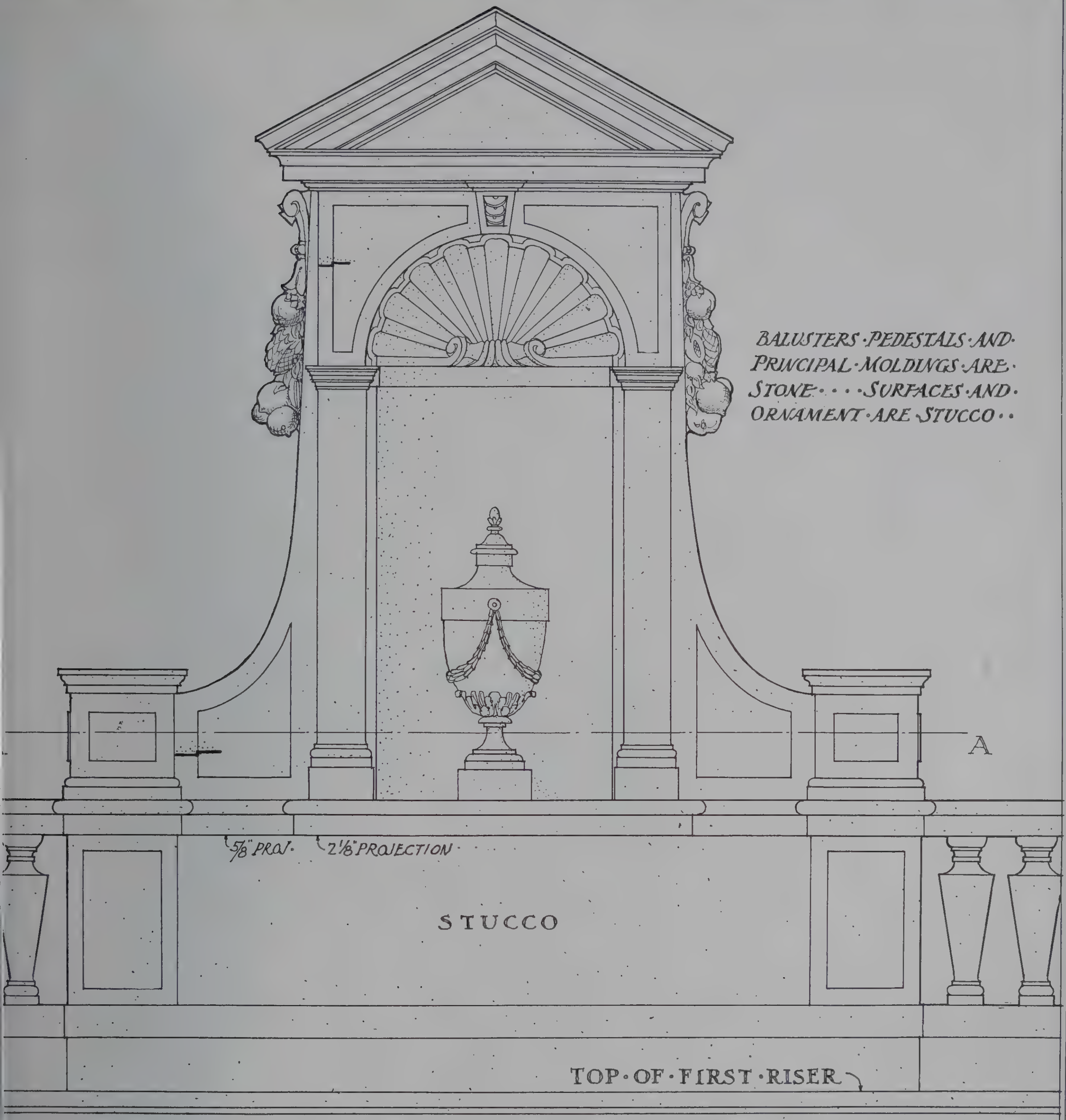
Amphitheater in the Boboli Gardens, Florence



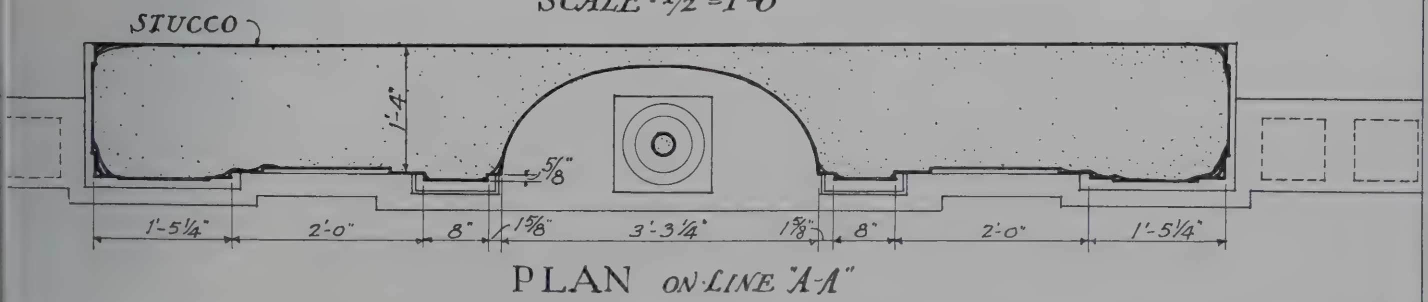
ITALIAN
DETAILS
1920

ARCADE·IN·COURTYARD OF·THE·BROLETTO·BRESCIA

MEASURED and
DRAWN by
WM·D·FOSTER



ELEVATION
SCALE · ½" = 1'-0"

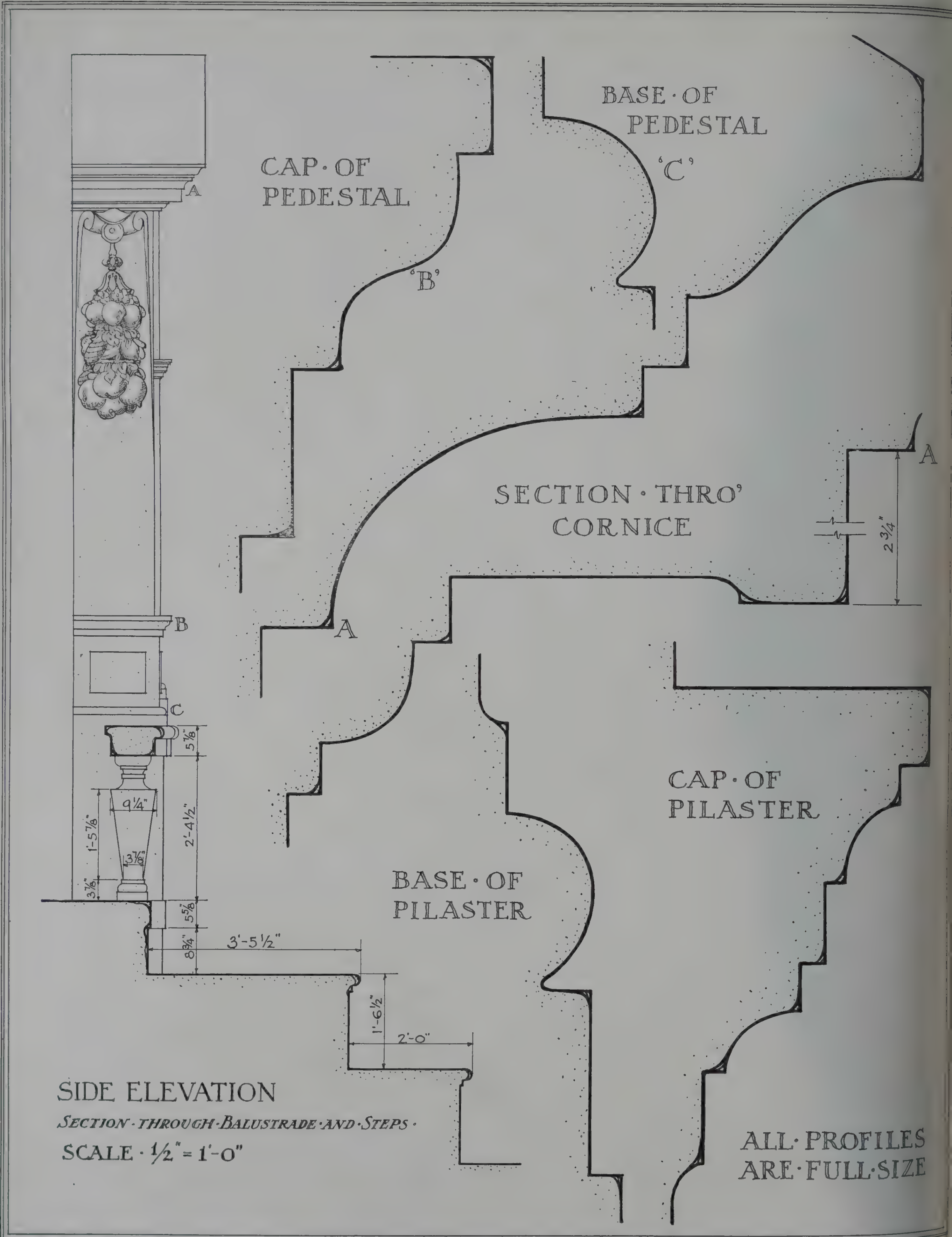


PLAN *ON · LINE "A-A"*

ALIAN
ETAILS
1920

MOTIF · FROM · AMPHITHEATRE BOBOLI · GARDENS · FLORENCE

MEASURED *and*
DRAWN *by*
WM · D · FOSTER



SIDE ELEVATION

SECTION · THROUGH · BALUSTRADE · AND · STEPS ·

SCALE · ½" = 1'-0"

ALL · PROFILES
ARE · FULL · SIZE

ITALIAN
DETAILS
1920

MOTIF · FROM · AMPHITHEATRE
BOBOLI · GARDENS · FLORENCE

MEASURED *and*
DRAWN *by*
WM · D · FOSTER

Notes on the Concrete Housing Conference

ILLUSTRATIONS OF CONCRETE HOUSING PROJECTS BY HERDING & BOYD, ARCHITECTS

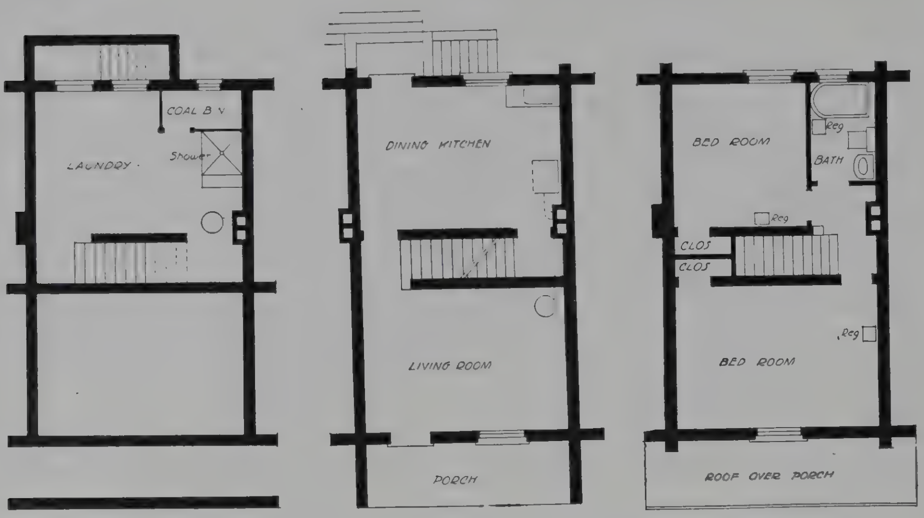
A BUILDING material that imposes special conditions which affect the character of architectural design always holds an interest for architects. Cement as commonly used in concrete is such a material, and though it has not yet been used to any large extent in the building of houses, at least where it has received architectural treatment the expectation of gathering some interesting data in connection with its use for that purpose was sufficient to attract an appreciable number of architects to the Conference on Concrete House Construction held in Chicago in the latter part of February.

Concrete is universally recognized to-day as a good structural material, and it has made remarkable progress in this direction through the active interest of capable engineers in developing it in various systems of construction. From the standpoint of design, however, much remains to be done — in fact, except for isolated instances, it has not received the serious attention of the architect, and the majority of residence work executed in concrete has not added anything to our store of beauty, but has on the contrary introduced new elements of bad taste, such as the rock faced concrete block. This, however, is not to be wondered at, for all new materials have to pass through an era of development, the early stages of which are usually crude.

In the present days of shortage of building materials and the high price of skilled labor, every building material should be given the most careful consideration, so that no opportunities for developing inexpensive systems of construction for residential work will be overlooked. Concrete, undeniably, has an important contribution to make in this respect; a satisfactory system of using it in small units for the smaller types of building has not yet been devised, but that constitutes the problem at hand, and it is, furthermore, one which architects are especially able to help solve. The structural characteristics of the material must be recognized in the type of design, a certain degree of standardization must be worked out that will permit of speed and cheapness in construction without unduly hampering originality in design, and a system of forms with some elasticity that can be made available to the small builder are the chief essentials needed before concrete can be counted on materially to help the housing situation.

Detail of Semi-Detached Houses at Youngstown

Block Plan of Housing Development at Youngstown, Ohio
Herding & Boyd, Architects and Town Planners



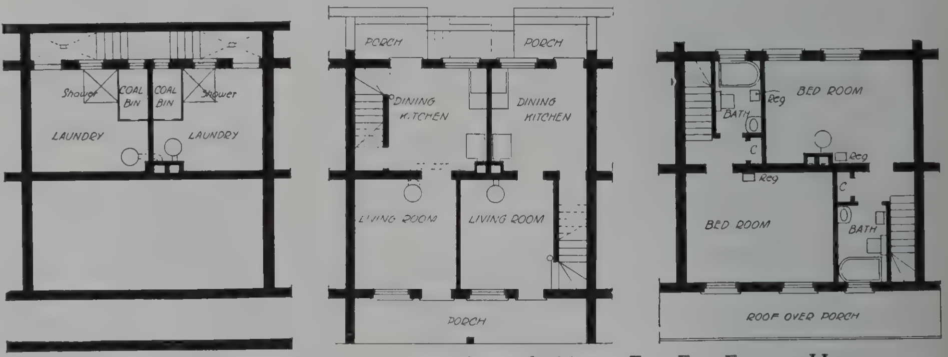
Basement, First and Second Floor Plans of Unit for Sixteen-Foot Frontage House

The conference was not productive of anything new in the way of construction or design. Its deliberations centered largely on the present economic conditions surrounding the housing question, and various resolutions were passed with the purpose of stimulating interest in building loan associations, priority of building materials as regards freight shipments, and other basic factors.

In a paper prepared and read by Irving K. Pond, F.A.I.A., some valuable suggestions were given relating to the development of concrete house construction from which the following are quoted:

"My first item of advice, if I may be permitted to offer advice to a body of men interested in the development of or handling a comparatively new and altogether worthy building material, is to treat the product with respect, to shun and scorn imitations, to recognize limitations, which attach to all materials as well as to all men, and to work within those limitations. This is not saying that because a thing has been done, and frequently and appropriately done in one material, it shall not be done in another or a new material which may be employed with equal propriety; however, the new material should not employ forms which are purely distinctive of the old, but should develop forms which inherently characterize the new.

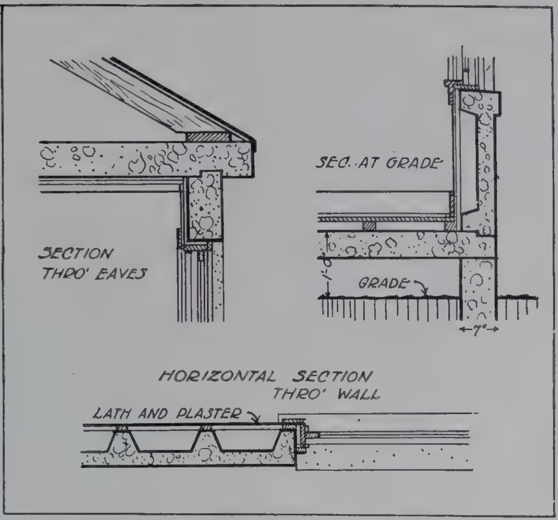
Now concrete is a material which lends itself to many kinds of manipulation. So many are the possible methods of its application — such a diversity of means may be employed toward its legitimate ends — that some of its enthusiastic sponsors see in it a panacea for structural ills and possibly for æsthetic building ills. Therefore, it behooves those who can impartially survey the entire field to offer



Basement, First and Second Floor Plans of Unit for Twenty-Four Foot Frontage House

View of Typical Semi-Detached Houses at Youngstown, Ohio
Herding & Boyd, Architects

both warning and encouragement — encouragement in its legitimate use, warning against its too free employment especially where other materials may better serve the conditions. . . . The factors of ease and economy in manufacturing concrete slabs, whether to be applied vertically or horizontally, contribute to a "simplicity" which tends toward stupidity and to a barrenness which begets ugliness. Where the general form is stupid and ugly not much in the way of reclamation can be effected by proportioning of windows or application of superficial ornament. If the mass is interesting and appropriately conditioned, geographically and climatically, slight defects in detail will not too seriously challenge the taste, but an ugly mass is fatal.



Details of Pre-cast Houses at Youngstown

Because concrete has for so long a time been poured into moulds or forms, and because of the coarseness of its ingredients, one of which was stone which could go through a two-inch ring, the earlier designers, — and I fear there were architects among them, — coupled in their minds concrete with crudity and coarseness of detail and, being dependent upon precedent and knowing not where else to look, fell upon the crude Spanish detail and broad masses of the early Spanish Missions as representative of what best might be embalmed in concrete, and so Spanish missions distorted into bungalows and cottages and palaces spread like a rash over the face of the country. . . .

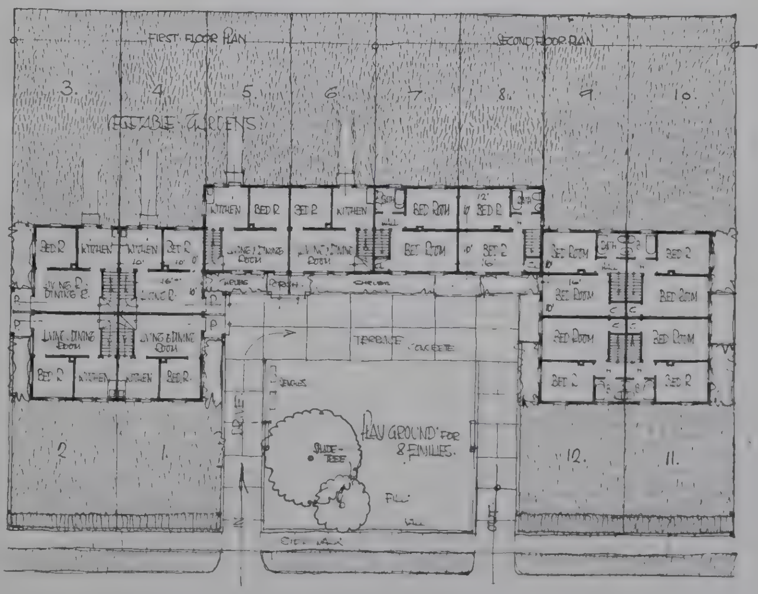
The waste entailed in the destruction of specially constructed and expensive forms has become apparent to many concrete users, and their efforts to prevent the consequent loss, especially in case of the smaller residences and the houses with which this conference is more particularly concerning itself, has introduced an element which may well call for restraint in its application. For the sake of economy, forms are used and re-used in close proximity. When such forms are not perfect in themselves and in utmost good taste, monotony in repetition becomes deadly, and woe is it to him whom cruel fate has condemned to inhabit a unit in an environment so constituted. . . .

In spite of the manifold and varied means, methods, processes, applications, manipulations, textures, surfaces and colors appertaining to the use and employment of concrete as a medium of architectural expression and embodiment, I am not certain that I should advise its sole and unlimited agency in housing the activities of any one neighborhood or community. Indeed, I am quite certain that I should not so advise; and this not altogether on the ground of a needed variety, but that there are other materials which transcend even concrete as a medium of certain desired expressions of the human spirit in the art of architecture. And I should desire to see no community curtailed of, or denied, the right and power to express the best that is in it in the materials best adapted to that expression. . . . In the matter of brick, for example, there is scale to the unit which relates the mass to human desire and experience in an intimacy possible with no other material, while in natural color and texture the range is boundless. But, even with all that, brick needs other materials in its neighborhood for contrast and variety — purple green of slate, soft white of stucco, weathered gray of timbers, with carvings and turnings, and craftsmanship which cannot be imparted by a mould however exquisitely the surface be wrought.

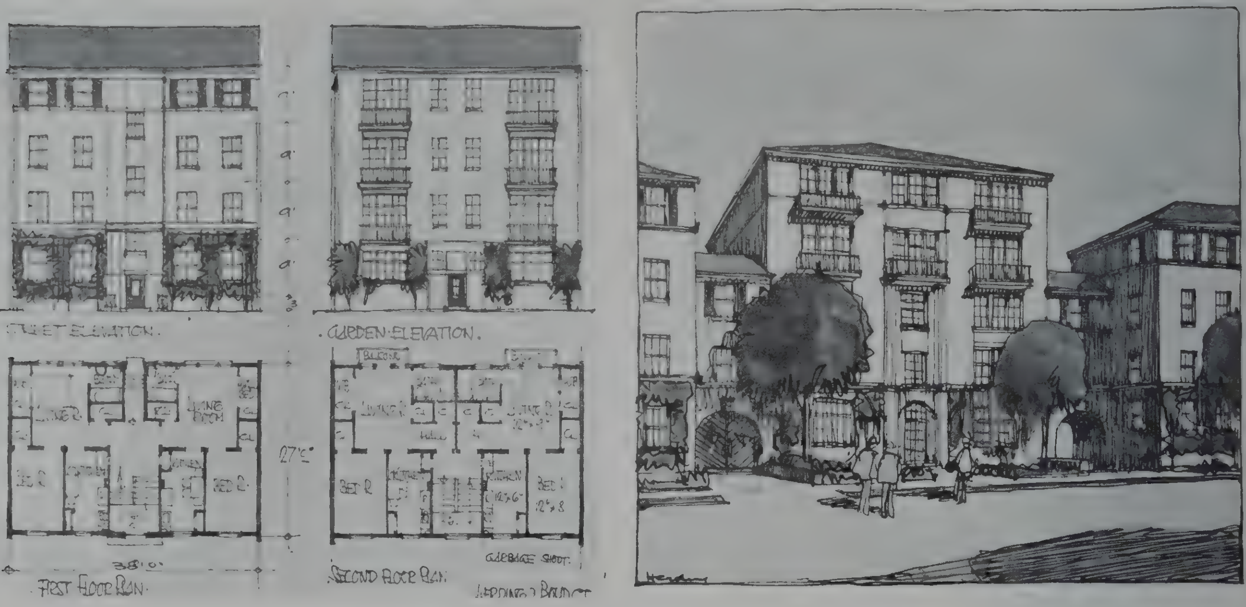
In connection with the Conference there was held an exhibit of concrete houses, some of which illustrated good architectural use of the material; most of the work, however, followed precedent in design associated with masonry or frame construction with stucco covering.

The illustrations herewith show one of the most

Sketch of Block for Plan Shown Below



Floor Plan of Block for Twelve Families, Youngstown, Ohio
Herding & Boyd, Architects

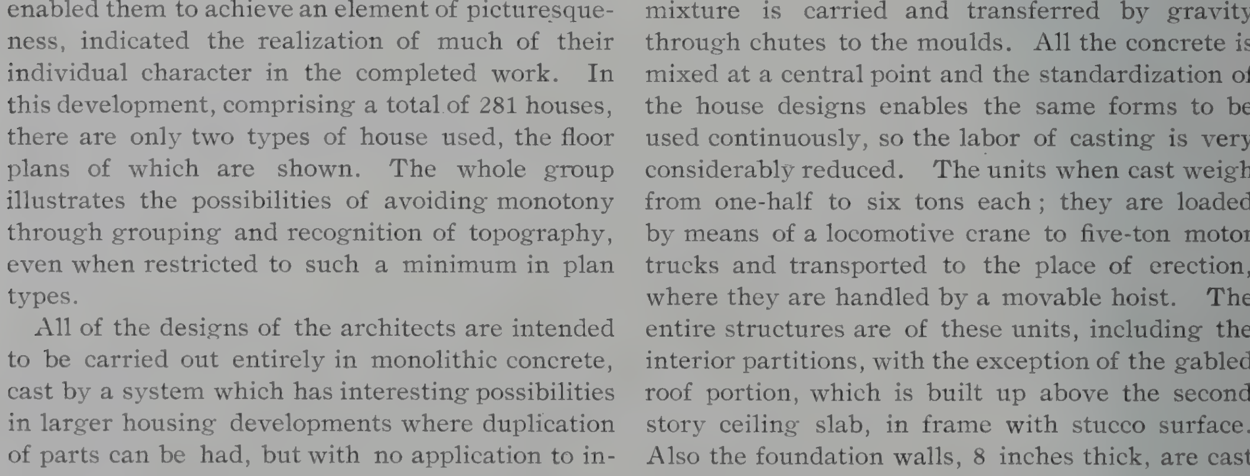


Sketches for Proposed Apartment Buildings, Herding & Boyd, Architects

interesting exhibits in that the limitations of the material are recognized in the design, and the architectural effect secured by pleasing masses and the use of color. Many attractively rendered sketches presented various arrangements of the standardized construction employed by the architects, and the photographs of a completed development at Youngstown, Ohio, where a hilly site enabled them to achieve an element of picturesqueness, indicated the realization of much of their individual character in the completed work. In this development, comprising a total of 281 houses, there are only two types of house used, the floor plans of which are shown. The whole group illustrates the possibilities of avoiding monotony through grouping and recognition of topography, even when restricted to such a minimum in plan types.

All of the designs of the architects are intended to be carried out entirely in monolithic concrete, cast by a system which has interesting possibilities in larger housing developments where duplication of parts can be had, but with no application to individual houses, or in groups of less than fifty or seventy-five houses. The system of construction is interesting, and a few words in description of it may be of value in pointing out the necessity of standardized units and means of employing unskilled labor if low cost concrete houses are to be made a reality.

The houses are erected from large, pre-cast concrete units, one unit being sufficient for an entire side wall, one story high, of a single house, or for the entire floor of one room. These units are cast in horizontal moulds that are placed along the sides of a spur railroad track, along which the concrete mixture is carried and transferred by gravity through chutes to the moulds. All the concrete is mixed at a central point and the standardization of the house designs enables the same forms to be used continuously, so the labor of casting is very considerably reduced. The units when cast weigh from one-half to six tons each; they are loaded by means of a locomotive crane to five-ton motor trucks and transported to the place of erection, where they are handled by a movable hoist. The entire structures are of these units, including the interior partitions, with the exception of the gabled roof portion, which is built up above the second story ceiling slab, in frame with stucco surface. Also the foundation walls, 8 inches thick, are cast in place in the usual way. The exterior wall slabs are 3 inches thick with 4 inches projecting ribs, 16 inches o. c., which make provision for the necessary air space; they are also rabbeted at the ends, so that spaces are provided for sealing with grout.



Sketch Elevation of Proposed Apartment House Group, Herding & Boyd, Architects

ARCHITECTURAL & BUILDING ECONOMICS DEPARTMENT

C. STANLEY TAYLOR, *Associate Editor*

A Forecast of Building Conditions during the Coming Season

WITH the opening of the spring building season, now almost at hand, reports from various architectural, contracting and building department offices indicate that 1920 is to be a year of great activity — perhaps a record year in volume of expenditure on building enterprises of a private or semi-public nature. Undoubtedly building projects are to be carried out this year under conditions of the most unusual nature, owing not alone to high cost of materials and labor, but to the definite shortage in many classes of materials and of labor at many points throughout the country.

The building demand, as indicated at the present time, may be divided into three classes, — utility, speculative and investment. Under the utility classification come industrial buildings, such as factories and factory extensions and construction to increase transportation facilities, such as wharves, piers, and warehouses and general terminal developments at receiving, shipping and transfer points. Speculative building represents only a transitory state of expenditure in which buildings constructed to meet a known demand pass with profit to the speculative builder into the investment class. This type, as usual, will be largely limited to dwelling, apartment house, store and office building classes, although the field of speculative building is extending into the construction of small factory units in many industrial centers. Investment building will be confined principally to the provision of housing, hotels, office space and public amusement enterprises. This year will undoubtedly show the greater volume of expenditure in the remodeling of buildings of every type.

The greatest volume of construction will undoubtedly be shown in the utility and investment classes. Speculative building is curtailed, not by a shortage of building and permanent mortgage money, but to the decreased share of the financial burden which loaning sources are willing to assume. In the investment class of building there is available more money for equity financing than ever before known. In addition to the usual class of real estate investors, money is for the first time in the hands of individuals who have never had investment funds before, and who instinctively believe in improved realty as an investment. High rentals, offering the possibility of sinking fund protection against shrinkage in replacement values, present additional inducement to invest in buildings offering various classes of rentable space. In the housing field there exists not only a condition where individuals for the first time are in a financial position to own a home regardless of high cost, but a determined attempt is being made by many communities to encourage the financing and construction of homes; local housing companies are being organized and, as in the case of St. Louis, Lockport, N. Y., Hartford, Conn., and several other large industrial communities, not thousands, but from $1,000,000 to $3,000,000 has been raised to provide housing for employees.

From the viewpoint of the architect and builder great interest lies in the questions relating to the volume of business to be expected and the classes of buildings in which money will be invested during the present and following years. It is evident that the wave of building activity is to pass over the entire country, particularly in the East, South, Middle West and on the Western coast. The South, broadly speaking, is for the first time since the Civil War in a position to finance extensive building construction. High prices received for cotton and agricultural products, together with receipts from oil production, have created a vast purchasing power in Texas alone, while the Southern Atlantic States will show great building activity. Manufacturing activity, particularly in the automobile field, is booming the Middle West from Detroit to Cincinnati; in the East the great cry is for increased production and, despite unsettled conditions, textile, leather and manufacturing corporations in other commodity lines are refinancing and expanding principally for the purpose of adding to plant investment.

The classes of building in which activity may be expected are evidently as follows:

Housing, group, individual and multi-family.
Industrial buildings and terminal improvements.
Schools, public buildings, banks, hotels.
Theaters and places of public amusement.
Automotive buildings, garages, etc.
Office buildings. Store buildings, retail.

The architect, as never before, should study the building material market to keep carefully in touch with the availability of materials. It would seem that for the first time in building history the volume of business is to be limited not by the available amount of financing, but by the production capacity of the material manufacturers.

The Co-operative Method of Financing Buildings

A CAREFUL analysis of general building material costs shows that the average increase over pre-war prices was approximately 60 per cent last summer and in January of this year close to 120 per cent. Labor costs in the construction field have increased almost 100 per cent. The statement, therefore, that the cost of building construction has doubled since the period immediately before the war, is certainly conservative.

The unusual shortage of rentable space which exists in practically all cities and industrial centers is creating a demand for new buildings which must be met, regardless of the cost of building construction. The factor which has not kept pace with the general increase, however, is that of money available for building and permanent loans; in other words — general mortgage money. Loaning institutions are not willing to make loans bearing the same relation to cost of building and land as those made in the pre-war period. Where it was possible to get a first mortgage loan of from 60 to 70 per cent of the cost of land and building during the pre-war period, this is not now possible except in isolated cases where loans are made on an amortization basis. Generally speaking, appraised valuations as made by loaning interests do not take into account the increased cost of building, with the result that it is difficult to finance any type of building in a substantial manner.

Considering the pre-war period, the average valuation of land used for the building of an office building, loft building or apartment house was usually approximately 20 to 25 per cent of the cost of the building. Taking 100 per cent to represent the value of land and building during the pre-war period, we find approximately 80 per cent of this amount represents building cost. This amount having practically doubled, would bring the total building cost to 160 per cent, and, adding 20 per cent for land cost, we have approximately 180 per cent to be expended to-day in place of a 100 per cent investment as made before the war. On a liberal basis of this 100 per cent, possibly 70 per cent could be borrowed, leaving an equity of 30 per cent. To-day it is not possible to borrow over 50 per cent of the cost of land and building, leaving an equity of 50 per cent to be furnished.

Considering these percentages in actual cost terms, we find, for instance, that a loft building which cost $160,000 to build, using land worth $40,000, represented a total investment of $200,000 in the pre-war period, of which $140,000 could be obtained through a first mortgage loan, leaving an amount of $60,000 to be furnished by the owners, either in cash or through the medium of a second mortgage loan which they would arrange.

To-day the same building would cost approximately $300,000, while the value of land would still be about $40,000, as there has been no great increase in general improved realty values. The total investment necessary for the same building would therefore be $340,000, on which it would be difficult to obtain a loan of more than $170,000, or, to be liberal, possibly $200,000 could be borrowed on first mortgage. This would leave an equity of $140,000 to be supplied by the owner. Of course rentals probably three times as great as those during the pre-war period can be obtained, and the investment can be safeguarded through the establishment of a sinking fund; but conditions nevertheless demand a much greater investment on the part of the owner.

Owing to the foregoing conditions, the reason why speculative building in this class of property has been largely eliminated is quite evident, as speculative building depends extensively on financing through ordinary loaning sources. The demand for space in office and loft buildings particularly has increased so rapidly, however, that in many instances individuals and companies needing office and manufacturing space have been forced to develop methods of financing through which the provision of buildings could be made possible. Large organizations having need for extensive space have proceeded to build on their own account. Where smaller amounts of space have been required, however, co-operative financing has developed, as might naturally be expected, and a number of office and loft building projects are now being developed along these lines.

The co-operative financing of loft buildings offers interesting possibilities as the demand for this type of rentable space is rapidly increasing. There are at least three methods through which the construction of loft buildings has been made possible by the co-operation of future tenants.

Owing to land values there is of course a minimum height which must be employed to produce a loft building on an economical basis. These buildings are usually built from eight to twelve stories.

The first type of co-operative operation is that involved where one manufacturing concern wishes to use five lofts, and in order to build an eight or ten-story building several smaller organizations are brought together to assist in the financing and to use the remainder of the space.

The second type of operation is that where future tenants of about 60 per cent of the space carry out the complete financing, and lease the remaining 40 per cent of space at rentals which will offset the

overhead cost of occupancy on the part of the owning group.

The third method is what might be termed the promotion method, in the course of which a real estate operator obtains a liberal building loan and first mortgage from a number of prospective tenants in order that the space which they require may be provided, and possibly with some rental concession.

The first method of co-operative financing is comparatively simple, and involves the obtaining of a first mortgage through ordinary loaning channels. This mortgage is sometimes made more liberal than usual through its guarantee by the future tenants. The amount of money needed to provide the equity is then furnished *pro rata* in accordance with the space to be occupied. The usual method of providing the financing of the necessary equity is the formation of a stock company capitalized for an amount approximately equal to the necessary equity. This stock is sold to the prospective tenants in ratio to the amount of space which each will occupy, and carries with it the occupancy privilege.

After the building is constructed a liberal estimate is made of the cost of maintenance, including interest, taxes and general maintenance cost. This annual cost is then apportioned according to the amount of stock held by each tenant, and the amount necessary is paid in the form of an owner's rental. At the end of each year this amount is adjusted, refund being made if there is a surplus, or an assessment, if additional funds are needed.

The second method of co-operative financing which involves the use of about 60 per cent of the rentable space by the owners, leaving 40 per cent of space to be rented, is somewhat more involved, but usually offers better financial inducement. In this type of financing a liberal first mortgage is obtained and prospective tenants of 60 per cent of the rentable space furnish the entire amount of money necessary to construct the building and purchase the land. The method of managing this building varies somewhat, but is usually on the following basis:

Owning tenants occupy an amount of space in proportion to investment up to a total of 60 per cent of the available space. The balance of space is rented to outside concerns at the highest rentals obtainable, usually on leases of ten years. The cost of carrying the building is estimated, and from this amount the income from rentable space is deducted, leaving an annual amount which is apportioned as an owner's rental among the owning tenants. This amount is, of course, subject to refund or assessment, in accordance with actual figures resulting from the operation each year.

The benefit of this method of financing is evident, as advantage can be taken of the shortage of rentable space to obtain unusually high rentals for the 40 per cent of rentable space which is leased to non-owning tenants. The profit involved in renting this space is a reduction of owner's rental, and the reduction of rental cost to the owning tenants, will usually be found to be a high percentage on the actual equity investment.

At least two buildings have come to the attention of the writer in which the speculative builder has made use of the need for loft building space as a means to obtain high percentage financing of the operation. In one instance the builder has erected a ten-story loft building, each loft being leased to an individual tenant. The actual cost of this building with the land was approximately $450,000. The first mortgage and building loan was approximately 80 per cent of this amount, being $360,000. This first mortgage was provided by the ten tenants, each advancing $36,000. The leases made with these tenants called for a square foot rental slightly under the prevailing market price, and an agreement was made by which the first mortgage is reduced through annual payments of 5 per cent of the principal until it has been reduced to approximately 50 per cent of the total cost of land and building. In this case, through assisting in the financing, the tenants were enabled to obtain rentable space which was not available otherwise.

One or two very large loft building projects are now under way in New York City for the clothing trades in which co-operative financing has been made the basis of providing first mortgage loans.

The co-operative financing of office buildings and apartment houses offers a considerably more involved problem which is, however, of interest, and will be given consideration in this department within the next two or three months. Several methods of co-operative financing of apartment houses have been attempted, some of which have proven unsuccessful. Following one system, however, a number of apartment houses have been built in New York City involving features of actual ownership of apartment units through investment and the payment of owner's rental. The actual investment and income figures on several of these buildings are being obtained and will be presented in detail for the guidance of those who are interested in financing apartment houses along the logical lines of co-operative ownership. In the field of office building construction, co-operative financing is still in the experimental stage; but one or two buildings now under construction offer interesting possibilities, and details will be presented as soon as available.

Financing Buildings on Leasehold Property

THE acquirement of extensive land holdings in important business districts, particularly by large estates and by individuals for investment purpose, has created a condition where this land, while not on the market for sale, is made available for building purposes through the medium of the long-term lease. Such leases are usually negotiated either for a term of ninety-nine years or for two or three consecutive terms of twenty-one years each. The basis of leasing usually involves the payment of all taxes and interest by the lessee, together with an annual amount which represents approximately 5 per cent return on the investment of the owner.

The financing of buildings on leasehold property is naturally more difficult than ordinary financing, where land and building are under one ownership. This is particularly true in the mortgage market to-day, where the only consideration for collateral is the actual value of the building, and there is available through direct channels practically no money for such loans.

In the principal cities of the East and Middle West, however, several buildings on leasehold property have been financed during the past year through the medium of first mortgage leasehold bonds, which have been sold directly to the public. It is not usually possible to finance more than 60 per cent of the cost of the building, and the building must be in the investment class, such as an office building or hotel.

Taking as an example a $4,000,000 office, theater and store building which has recently been promoted in a Western city, the method of financing the first mortgage has been as follows:

After the plans and specifications had been worked out, showing that the cost of the building would be approximately $4,000,000, the first step taken by the owner was to deposit with a trust company securities covering the equity of 40 per cent of the cost, or $1,600,000. This was done after an investment security company had agreed to underwrite 60 per cent of the amount of this building, or an amount of $2,400,000, and the deposit of 40 per cent by the owner was for the purpose of guaranteeing to the public that this building operation would be carried out when the total bond issue had been sold. This amount of $2,400,000 was issued in the form of 6 per cent first mortgage leasehold bonds, due serially beginning one year after completion of the construction of the building, to the amount of $120,000 a year, or 5 per cent annual return of principal. In this manner over a period of twenty years the entire issue of bonds will be redeemed. The bonds were placed on the market at face value in denominations of $500 and $1,000, to yield an annual interest of 6 per cent. These bonds were secured by a first mortgage lien on the leasehold and building under construction. No value was attached to the leasehold, the issue of bonds representing 60 per cent of the cost of the building only, which is the customary method.

It was estimated that after the payment of taxes the net annual earning of this building would be $500,000, — an amount sufficient to cover all interest payments and annual bond retirement.

Another interesting example is a large factory which was constructed for the purpose of renting for light manufacturing. The estimated cost of this building was $1,000,000, and the bond issue was for $600,000, in denominations of $100, $500 and $1,000, paying an interest of 7 per cent. The bond issue was secured by first mortgage on the leasehold property and the fireproof brick and concrete building. In this case the completion of the building through the provision of the equity by the owner was guaranteed through a trustee by assurity bond. The building was in the investment class, being constructed to provide rental space for light manufacturing, which was greatly in demand in that district, and a conservative estimate showed an earning capacity of approximately $130,000 a year. In this case the bonds mature serially in increasing annual amounts, starting at $30,000 in 1920 and increasing to $48,000 in 1928, the balance of about $290,000 being due in 1929, this refunding the entire principal.

From the foregoing figures it is evident that the principal involved in the financing of buildings constructed on leasehold property involves generally the provision through a bond issue of 60 per cent of the cost of the building. The investment value of the building after paying taxes and land rental must be such that all interest charges can be met, together with the payment of matured bonds. Thus, over a period varying from ten to twenty years, 60 per cent of the cost of the building is refunded from the rental income, leaving at the end of this period a building in which the investment has been reduced to 40 per cent.

The leasehold building operation offers the possibility of creating rentable space on a much lower actual investment, as the purchase of land is unnecessary, the land element in the operation being represented only by an annual rental and tax charge. In many instances leaseholds of this nature increase considerably in value, and it is often found that at the end of the period of normal value of the building, the leasehold itself represents collateral of high value.

Appraising the Value of Lots of Unusual Dimensions

With the expanding interests of the architectural profession, there are new subjects coming to the architect's attention on which information is desirable. In the field of investment building particularly, a working knowledge of real estate practices is invaluable. It is to serve in this capacity that the following article has been prepared, in which are brought together for reference the most usual means for determining the value of parcels of land that are special in character, due to their location or size. — EDITOR.

IN many sections of the United States the next year will show unusual activity in the purchase of land for building purposes. The average buyer of lots for building will be a prospective home builder or investment builder. One of the important questions which this class of realty buyer must face is that of purchasing land which is within economic limitations of the building investment which he proposes to make. Normally, in the various districts where building is contemplated, vacant land has a well defined lot value. In some cases this value is based on front footage, but in many instances, particularly in New York City, the land value is estimated per lot 20 or 25 by 100 feet.

In buying and in selling city lots a puzzling question arises when a lot is either shorter or deeper than 100 feet, or where it is a corner lot. There are several definite methods of arriving at the value of lots of unusual dimensions or location, and it might be of interest to prospective real estate buyers to have these methods of computing values brought together for reference purposes. The more important and most generally used rules of this type are as follows:

The first rule to be given is known as the Hoffman-Neill Rule and is a calculation carried out to show the proportion in value of each foot in depth of any lot from 1 foot to 100 feet. According to Mr. Lawson Purdy, who was for eleven years President of the Department of Taxes and Assessments of the City of New York, this rule was originally developed by Judge Murray Hoffman about fifty years ago and was known as the Hoffman Rule, being a simple deduction or declaration that the front half of a lot is worth two-thirds of the value of the full lot. Later, the Real Estate Editor of the *New York Evening Mail*, Henry Harmon Neill, carefully calculated the proportions resulting from the application of a rule that, taking 100 feet as a basis of unit of depth, the value for the first 50 feet of this depth is two-thirds of the whole. This resulted in the Hoffman-Neill Rule as follows, the 100-foot figure representing the appraised valuation of a full lot :

Hoffman-Neill Rule

Feet	P. C.	Feet	P. C.	Feet	P. C.	Feet	P. C.	Feet	P. C.
1	0676	21	4012	41	5934	61	7492	81	8837
2	1014	22	4123	42	6018	62	7563	82	8901
3	1286	23	4232	43	6102	63	7634	83	8964
4	1520	24	4339	44	6185	64	7704	84	9027
5	1732	25	4444	45	6267	65	7774	85	9090
6	1929	26	4548	46	6348	66	7843	86	9153
7	2112	27	4650	47	6429	67	7912	87	9216
8	2282	28	4751	48	6509	68	7981	88	9278
9	2443	29	4850	49	6588	69	8049	89	9340
10	2598	30	4947	50	6667	70	8117	90	9401
11	2748	31	5042	51	6745	71	8185	91	9462
12	2893	32	5136	52	6822	72	8251	92	9523
13	3033	33	5229	53	6899	73	8317	93	9583
14	3168	34	5321	54	6975	74	8383	94	9643
15	3298	35	5412	55	7051	75	8449	95	9703
16	3424	36	5501	56	7126	76	8514	96	9763
17	3547	37	5589	57	7201	77	8579	97	9823
18	3667	38	5676	58	7275	78	8644	98	9882
19	3784	39	5763	59	7348	79	8709	99	9941
20	3899	40	5849	60	7420	80	8773	100	10000

For calculating the value of front inside lots there is also the Lindsay-Bernard Rule as follows in which a lot 150 feet deep equals $100 as a unit value. In this rule is shown the percentage of valuation for lots of varying depths up to 200 feet.

Depth from Front	Per Cent of Value	Depth from Front	Per Cent of Value
5	9.	90	84.2
10	15.	95	86.2
15	21.	100	88.
20	27.	105	89.6
25	33.	110	91.1
30	38.5	115	92.5
35	44.	120	93.8
40	49.	125	95.
45	54.	130	96.1
50	58.5	135	97.2
55	63.	140	98.2
60	67.	145	99.2
65	70.6	150	100.
70	73.9		
75	76.9	175	103.
80	79.6	200	105.
85	82.		

The Valuation of Corner Lots

In discussing the question of appraising corner lots, Mr. Purdy states he does not believe that any rule having universal application has been devised. While the Hoffman-Neill Rule is of very general value for the determination of the value of short lots, all appraisers are well aware that it can generally be applied only to plots of land which are of usable shape and size. The same principle applies to any rule for the determination of the value of corner lots. Moreover, while a corner 100 feet

square in one ownership may be increased in value as to all of its area by reason of its corner position, it is generally true that the corner influence does not extend beyond a permanent structure erected on the corner, even though that structure be only 25 feet wide.

While no rule should bind the judgment of an intelligent assessor, the study of rules may be of great aid to judgment. For the purpose of consideration and discussion the more important part of the rules formulated by Mr. W. A. Somers for the determination of the value of corner lots is given, also the simple rule presented by Mr. Alfred D. Bernard, Special Assessor to the Appeal Tax Court of Baltimore, as set forth in his book, "Some Principles and Problems of Real Estate Valuation."

The Somers Rule

For the determination of the increment of value attaching to a plot of land 100 by 100 feet, on a corner over what it would be worth if it were an inside plot, Mr. Somers has constructed a curve. When this curve is laid down upon a sheet ruled in squares representing one foot, every variation of value may be determined with accuracy. As a practical matter, ten variations of the rule will ordinarily suffice. The principle upon which Mr. Somers' curve is based is the fact that a corner is more valuable as compared with an inside lot when streets of equal value intersect than when a street is intersected by one of less value.

Corner lots 100 by 100 are increased above the value of inside lots. The greatest increase is when two streets of equal value intersect each other, and the smallest increase is that due to a blind alley which amounts only to an easement of light and air. The following table shows the percentage of increase enjoyed by a corner lot determined by the relative value of the intersecting street to the best street when the best street has a value of $1,000 a foot. The corner 100 by 100 is increased as follows:

Side Street Value	Per Cent	Side Street Value	Per Cent
0	6.	$600	25.2
$100	8.3	700	30.2
200	11.1	800	36.2
300	14.1	900	43.2
400	17.3	1000	51.
500	21.		

When the aggregate increase of a corner lot 100 by 100 has been determined from the previous table, the value of a lot of any width 100 feet deep fronting on the best street may be ascertained from the curve of value. The following table shows the percentage of the total corner increment for a lot 100 by 100 which attaches to various parts of the lot. Thus 5 by 100 on the corner is increased by 23.5 per cent of the total increment for the whole lot 100 by 100 as shown by preceding table:

Feet	Per Cent	Feet	Per Cent
5	23.5	55	92.
10	38.5	60	94.
15	50.4	65	95.5
20	59.3	70	97.
25	67.4	75	97.9
30	73.5	80	98.75
35	78.8	85	99.2
40	83.	90	99.5
45	86.5	95	99.8
50	89.4	100	100.

Mr. Bernard explains the valuation of corners as follows:

"In our work in Baltimore City we studied the situation carefully and tried out various theories on hundreds of known sales, and we found that as long as we tried to fix a rule to measure the extent of corner influence, we could not reach a satisfactory rule of value which could be proven; but if we fixed the extent of corner influence by the normal utility of the corner and recognized the property lines of individual owners, we could reach a *minimum* value for a corner lot which we could prove almost invariably.

"We found that unless the corner lot was a small one, that ordinarily corner influence did not extend beyond the actual corner holding, and if the lot itself was available for the best utility of the zone, we were sure of it; and if any additional value attached to the adjoining inside lot, it was potential and speculative, the exception being where we were appraising lots on low valued side streets working up to high valued main streets.

"Therefore, to get the value of a corner lot in the business district of a given city, we proposed this rule, which because of the co-operation of my co-worker in the Department of Assessment and Review of Baltimore, we have called the Lindsay-Bernard corner lot rule for business districts.

"First, reduce the lot to its logical front, which will be on the highest valued street, whether the lot actually faces it or sides on it.

"Second, find its value as an inside lot on the main street.

"Third, find its value as an inside lot on the side street, producing it on the Lindsay-Bernard Rule: the sum will be the minimum value for the corner.

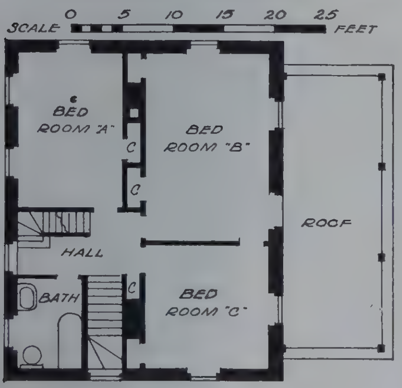
"Fourth, add all the minor factors of value, which suggest themselves to an intelligent appraiser.

"This is as far as we can go, and we believe we have gone the limit."

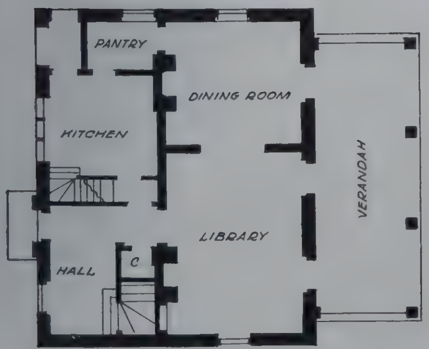
A Small Brick House at Germantown, Pa.

EDMUND B. GILCHRIST, ARCHITECT

ENTRANCE FRONT



SECOND FLOOR PLAN



FIRST FLOOR PLAN

VIEW FROM GARDEN

EDITORIAL COMMENT

WHAT is a competition? The architectural profession is vitally interested in a correct answer to this question. The American Institute of Architects has established a certain code which defines, more or less clearly, the status of competition in architectural problems, but apparently the conditions are not entirely clear in the minds of the members of the profession.

In the old days one of the first steps in solving an important problem was to invite certain architects to participate in a competition. In some instances all were paid and in others only the winner received compensation. In recent years, however, it has developed that the owner or a building operator would approach an architect and lay before him his building problem. The architect takes for granted that he is the only one thus approached. He will prepare the drawings and submit them to the owner, only to find that other architects have also submitted their drawings. Judicial authority has decided that this constitutes an unauthorized competition. Men have submitted sketches under these conditions who would under no consideration enter a competition.

What can be done to protect the architect against undeserved censure? The architect is called in conference with an owner. Theoretically he must ask the owner if any conferences have been held with other architects. If so, he must decline to confer further unless the owner first approaches the American Institute of Architects, asking that a competition be arranged.

Obviously the first architect approached would receive a negative answer to his inquiry. The next man might not be so ethical, and would refrain from asking questions. Under the recent decision the first man is as culpable as the second, although, in reality, the second man is the only one to enter in competition.

An owner asks an architect to prepare sketches for a project. Other architects hear of it and offer sketches. The owner is willing to receive suggestions so long as he is under no liability therefor. He is determined that if the construction proceeds, the architect he first approached shall execute the commission. Is this a competition? Is the first architect in any degree to be criticized for unprofessional conduct? Such conditions have existed. It is obviously unfair to the architectural profession and some changes should be made in any code which does not afford justice and equity. A good, healthy competition is sometimes desirable, but decisions as in the cases noted detract from the strength of the Institute and the loyalty of its members.

The Code of Ethics of the American Institute is a heritage of the days when the profession was individualistic. Building operations were carried on largely by individuals rather than by corporations. Each architect was identified, more or less closely, with certain clients. What is more natural under these conditions than that the profession should establish a code to prevent the unprincipled practice of "stealing a client" from another architect.

Nowadays all the major work is done by corporations or trusts composed of a number of men. The individual, both in real estate operations and in architecture, is not so prominent. What is more natural than that several directors of a trust should have friends in the profession and individually approach them for suggestions? If this is competition, the code should be amended.

A competition was recently held which was not disapproved by the American Institute and which was held in accordance with its rules. The building referred to was already designed from a structural standpoint by an engineer, and was final as to location of columns, window spacing, floor heights, grades, etc. No latitude whatever was given to the architect to do anything except make an outside to fit the proposed building. Yet the competitors were invited to participate as architects.

If the tendency of modern times is to develop architects as dressmakers for engineer's frames, then the architect might as well give up his profession and strive to become an engineer in the newly accepted sense. If the architect values his profession, its ethics, its moral standards, its opportunities only to the extent of getting a "job," it might be for the best to give up architecture. He must have the fortitude and courage necessary to refuse to be made a mere draftsman unless he is prepared to acknowledge that his best work is done under the direction of some more capable executive.

Every architect, without doubt, remembers the attitude taken by the Government toward the architectural profession in the early war period, and how he was distinctly sidetracked by any one who called himself an engineer. If this condition is sought after by the architects as a whole, there is no better way to tell the Government and the business world that architecture is no longer an able, efficient, business-like profession than by assisting in just such problems as outlined above.

The profession has been criticized from the standpoint of its unbusiness-like methods, its over-accentuation of art and the ethical side. Recent events would seem to give the criticism weight.

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At right, Ketchum Hotel, Tulsa, Okla. Arch.: Geo. Winkler, Tulsa, Okla. General Cont.: Van Horn & Brickner, Tulsa, Okla. Roof Cont.: Builders' Supply Co., Tulsa, Okla.

Below "Mid-Co" Bldg. (Mid Continent Oil & Gas Co), Tulsa, Okla. Arch.: Schumacher & Atkinson, Tulsa, Okla. Gen. Cont.: Hoffman Bros., Kansas City. Roof Cont.: Builders' Supply Co., Tulsa, Okla.

Below: S. H. Kress Building covered with a Barrett 20-Year Specification Roof. Roof Cont.: Tulsa Roofing Co., Tulsa, Okla.

At the left: Kennedy Building, Tulsa, Okla. Architect and Gen. Cont.: A. W. Black & Son, St. Louis. Roof Cont.: Builders' Supply Co., Tulsa, Okla.

Below: R. M. McFarlin Building, Tulsa, Okla. Arch.: Geo. Winkler, Tulsa, Gen. Cont.: Van Horn & Brickner, Tulsa. Roof Cont.: Builders' Supply Co., Tulsa.

Manufacturers' Catalogs and Business Announcements

CATALOG REVIEWS

The publications listed below have been recently prepared by building material and equipment manufacturers. Unless otherwise stated, copies can be obtained without charge by addressing the concerns direct at the addresses given. Mention of THE FORUM will be appreciated.

THE MATHEWS MANUFACTURING COMPANY, Cleveland, Ohio.
"Garden Craft," Catalog of Outdoor Furniture (10 x 13½ ins.). 116 pp.

The output of the above company is thoroughly represented in the pages of this large book. There are well over two hundred illustrations of trellege in its varied forms so generally recognized in the English garden of to-day. Many of the designs shown are replicas of English and French pieces, and others are from architects' sketches or by designers on the Mathews staff. Although this book serves to show what the Mathews Company is capable of accomplishing in special work, a large number of these products may be had on receipt of order. It will be noticed that large and elaborate commissions, such as swimming pool pergolas or temples, are carried out as well as the simple garden bench, table or gate.

THE STANLEY WORKS, New Britain, Conn.
"8 Garages and Their Stanley Garage Hardware" (3½ x 6¼ ins.). 32 pp.

Although of diminutive size, this booklet furnishes the basic facts of garage equipment to a considerable extent. Starting with brief recommendations for the layout of the structure, it is followed by eight photographic examples of varying design, both as to exterior and plan. Figures are given on the floor plans with the convenient and proper location of working gear, and the comments on each type of garage are followed by quantity schedules of Stanley hardware. The contents close with a summary on hinges, butts, latches, bolts and the well known door holder.

AMERICAN FACE BRICK ASSOCIATION, 110 South Dearborn street, Chicago, Ill.
"The Story of Brick" (7 x 9 ins.). 56 pp.

With the issuing of this booklet, a treatise on the history, manufacture and use of brick is available to the building trades and layman that will familiarize each with their possibilities in case of their contemplated use. To any one who is working in this building material a fund of data is contained here in handy form. The real mission of this book is an appeal to prospective builders to consider face brick as a medium in which to carry out their chosen designs for a residence. Under a section devoted to home building there are the following headings: "On Financing Home Building," "Handling the Mortgage," "Building and Loan Associations," etc. Considerable space is given to the exceptional merits, technical practices and artistic qualities of face brick. Among the fine illustrations and diagrams appear time honored structures of brick and beautiful dwellings of to-day wrought with the same charm that is so irresistible.

ANNOUNCEMENTS

Mr. Erick S. Anderson announces the opening of an office for the practice of architecture at Room 709, Peoples Savings & Trust Building, Akron, Ohio. Manufacturers' catalogs and samples requested.

Mr. Flournoy G. Hagan announces the opening of an office in the First National Bank Building, Paris, Ky., for the practice of architecture and structural engineering, the title of the firm to remain as Wm. K. Hagan & Son.

Mr. Charles S. Keefe announces that he has severed his connection with the firm of Alfred Hopkins and Charles S. Keefe and is opening an independent office for the practice of architecture at 368 Lexington avenue, New York, N. Y.

Mr. William Drago and Mr. L. Milton King, associate architects, announce the opening of an office for the practice of architecture at 217-A De Siard street, Monroe, La. Manufacturers' catalogs and samples requested.

Messrs. Davenport and Williams, delineators, announce their association and opening of offices in the Castle Hall Building, Indianapolis, Ind., for the practice of architectural rendering.

Mr. Joseph Hudnut, architect, announces the opening of an office for the practice of architecture at 41 Union square, New York, N. Y.

Mr. Robert J. O'Neill announces the opening of his office for the practice of architecture at 1147 Connecticut avenue, N. W., Washington, D. C. Manufacturers' catalogs and samples requested.

Mr. Melvin T. King, of Russell & King, Architects, has secured the services of Fred B. O'Connor as chief draftsman and office manager in the Syracuse office.

Mr. O'Connor has been special architectural designer for New York State for the past fifteen years and has personally designed the developments at Sing Sing and Wingdale Prisons; Cornell Drill Hall, Ithaca; numerous State Hospitals and Armories throughout New York State.

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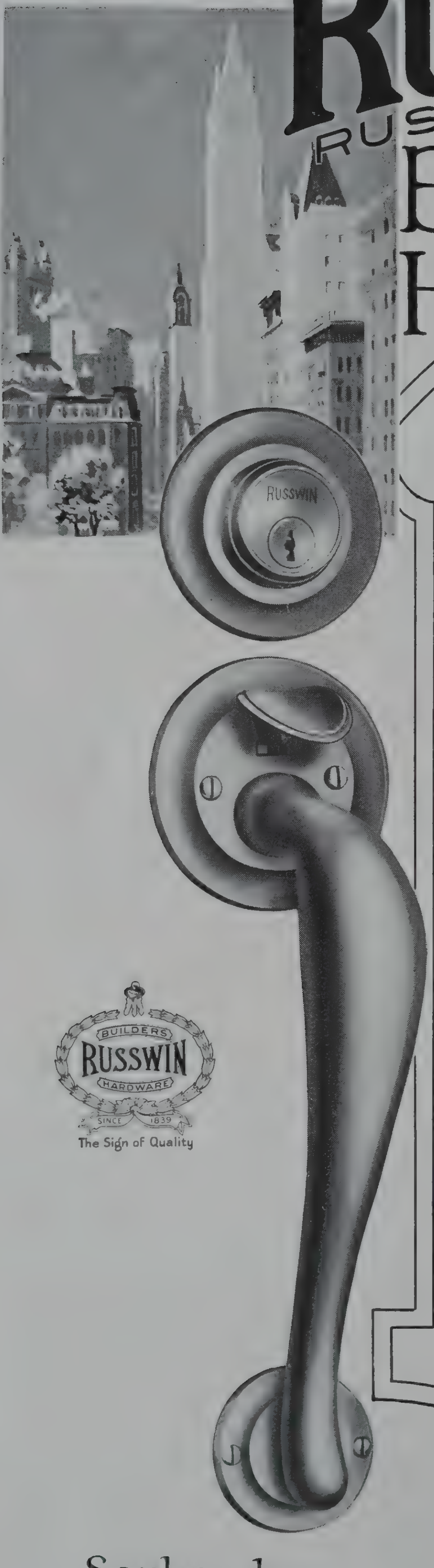

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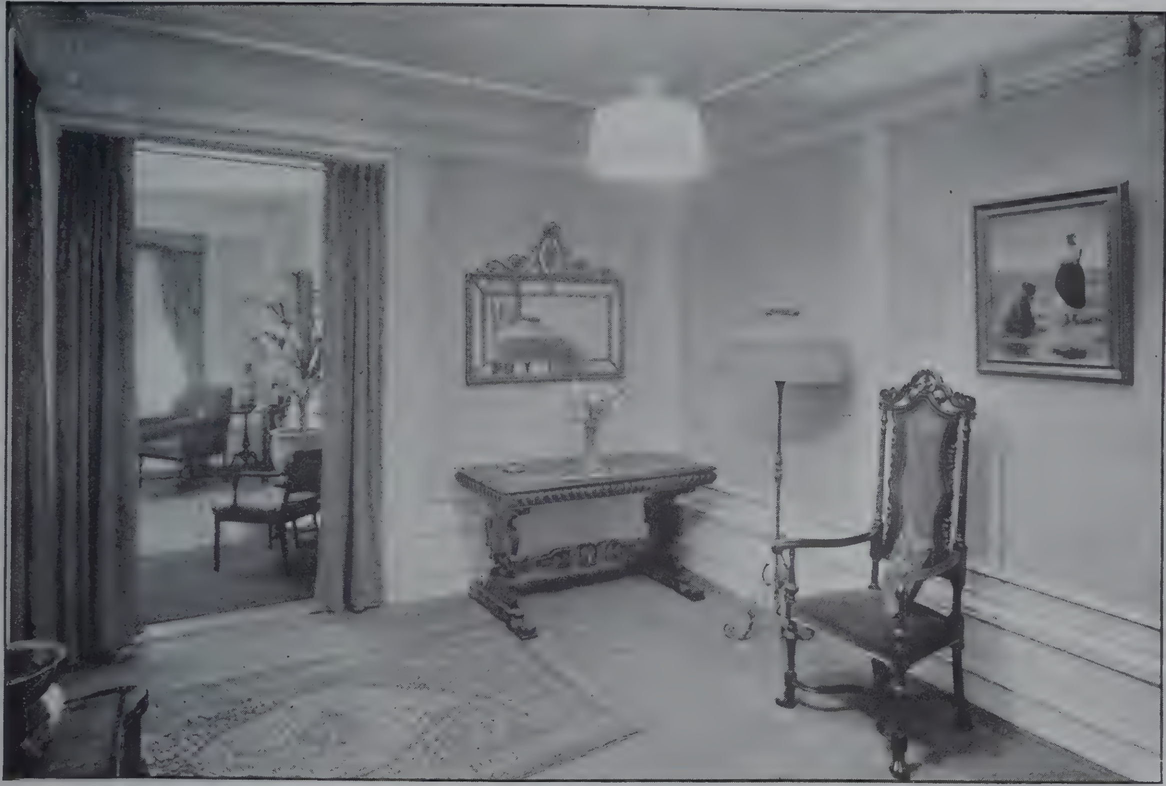

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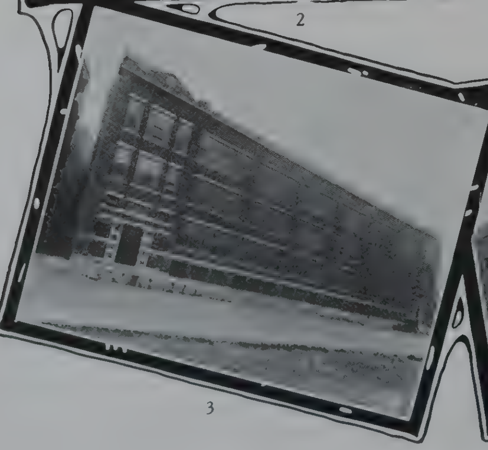
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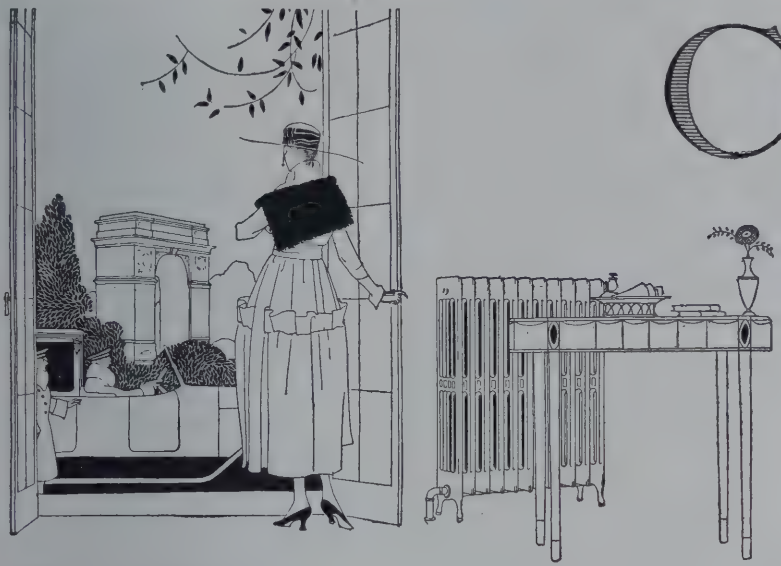

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THE ARCHITECTURAL FORUM

VOLUME XXXII NUMBER 4

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PLATE ILLUSTRATIONS

LETTERPRESS

ALBERT J. MacDONALD, Editor

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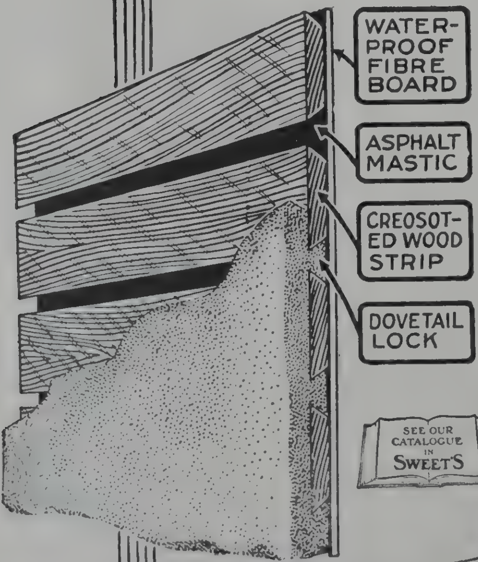

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THE EDITORS FORUM

MATERIALS OF MADISON SQUARE PRESBYTERIAN CHURCH USED IN NEW BUILDING

THOSE architects who so keenly regretted the passing of that little gem of modern architecture, the Madison Square Presbyterian Church, which was probably the masterpiece of the late Stanford White, may take some consolation in knowing that the beautiful materials and detail with which it was ornamented still live, though in a totally different composition than the original.

It was a distinctly happy thought that occurred to Donn Barber to make use of these gorgeous materials in a building at Hartford, Conn., located in a commanding position, and which otherwise, because of present stringent conditions, would have been required to join the ranks of what we ordinarily term "utilitarian architecture." The problem of shaping a fixed quantity of material into a new façade was in itself a severe task, and Mr. Barber is to be congratulated on the ingenuity which he displayed in developing a building under such unusual and difficult circumstances.

COMPETITION FOR THE REMODELING OF A NEW YORK CITY TENEMENT BLOCK

THE acute housing conditions which prevail in all large centers have directed attention for many months to means of affording relief that can be worked out practically under the distressing economic situation prevailing to-day. New York City is undoubtedly suffering to a greater extent than any other city of the country, and the officials who are aware of the actual existing conditions are unable to offer any hope of improvement, because there is but a pitiable amount of new construction under way or even contemplated that will aid the class of people most in need of help, because of the high building costs and the difficulty of obtaining the necessary financing.

The Reconstruction Commission of the State of New York has given considerable study during the past few months to the housing problem, and the most tangible result of its efforts is the suggestion that the many old law tenements in the lower part of New York City which are now largely uninhabitable be made over to afford wholesome, light, airy, sanitary places in which to live. This undoubtedly offers the most feasible method of securing an appreciable amount of living accommodations at a cost that would not make rents prohibitive and thus defeat the ends sought.

Most of the defects of the old tenements are due to poor planning. Their value not only in terms of better living conditions, but also as a financial investment, would be enhanced if they were properly planned. All of these buildings were erected previous to the enactment of the Tenement House Law nineteen years ago. Since then great progress has been made in the planning of tenement and apartment houses, and it is now conclusively proved that much greater space can be allowed for courts without decreasing the net rentable area if modern planning principles are followed.

The benefit that would come to the housing situation in New York if these tenements were remodeled, can be seen in the fact that out of a total of 982,926 individual apartments in March, 1919, 587,851 were in old law tenements. It might be expected that in the usual course of events they would be replaced with modern structures, but in the ten years ending March, 1919, only 58,552 apartments were destroyed. At this rate it would take one hundred years for the last of these buildings to disappear.

The Reconstruction Commission, in conjunction with the Joint Legislative Committee on Housing, has instituted a competition for the study of a typical block of old law tenements in New York City to obtain suggestions for remodeling them into decent living quarters at a moderate expense. It is hoped the competition will produce the best method of improving living conditions without destroying the buildings, and suggest a plan of remodeling that will encourage such alterations by the demonstration of its economic wisdom. The relation of costs to results obtained will be a predominating factor in determining the judgment. For the purpose of the competition the block bounded by Rutgers, Madison, Jefferson and Monroe streets, on the lower east side, has been selected. Any person is eligible to compete. Competitors will be furnished with two plans of the block, one of the ground floor and the other a typical floor, and the elevations of the four street fronts. Only two drawings are required,— the revised plans of first and typical floors,— but an additional drawing showing a bird's-eye perspective may be submitted at the option of the designer. The competition will close on June 15, 1920, and drawings should be delivered at Room 302, Hall of Records, New York City. A total of $5,000 will be awarded in prizes : two of $1,000 each, four of $500 each and four of $250 each. Further information and copies of the program may be had by addressing Clarence S. Stein, Secretary, Housing Committee, Reconstruction Commission of the State of New York, Room 302, Hall of Records.

PENCIL SKETCH OF A
DESIGN FOR A MEMORIAL
BY O. R. EGGERS

The ARCHITECTURAL FORUM

VOLUME XXXII APRIL 1920 NUMBER 4

Branch Offices of State Banks in Detroit

By JOHN M. DONALDSON, F.A.I.A.

THROUGH my friend, Mr. X, the President of one of the largest State Banks in Detroit, I learn that the growth in deposits and in volume of accounts in the branch banks of the downtown State Banks of Detroit has been the subject of much interest and comment in financial circles of other large cities.

Records show that the deposits in many of these branch banks greatly exceed those of the average small city or country banks.

It has been demonstrated in Detroit that through the offices of the branch banks the merchant and manufacturer can obtain all of the services of the downtown office, including loans, payrolls, etc., and that the wage-earner and good wife can in them find safe and convenient depository for savings in their home vicinity, and thus save time that would otherwise be required in going downtown and often waiting in line at the main bank.

The first branch banking office in Detroit was inaugurated about thirty years ago, but they did not come into general use until within the last fifteen years with the rapid growth of Detroit, which brought to the city a great population of foreigners, most of whom knew nothing about savings banks.

The establishment of branches which brought to the homes and shopping centers the strength and the facilities of a great downtown bank has doubtless encouraged savings and prevented the multiplication of weak and irresponsible neighborhood banks.

Much money has thus been accumulated and utilized in the upbuilding of Detroit, which would otherwise have been kept out of circulation.

These savings have been used to the great advantage of the community in financing the enormous home building operations of this city.

The success of the branch banks of Detroit is beyond question, and in the later years many well designed and fully equipped banking offices have been built to meet the demands of increased trade and competition.

It is the general practice to carry loans, mortgages and collaterals, as well as reserve cash, in the strong vaults of the main offices, as this makes for a simple accounting system; but the branch manager through a private wire communicating system can furnish as rapid service on loans as the main office.

The equipment and office conduct of the branch office does not differ, except in degree, from that of the main banking office.

In large industrial cities where community centers are naturally developed, the larger banks find it good business to bring the banking facilities to the people, and in so doing they have served not only their interests but those of the people.

Interior, Wayne County and Home Savings Branch Bank, Detroit
Albert Kahn, Architect

Exterior and Floor Plan, Dime Savings Bank, Fourteenth Avenue and Ferry Park Boulevard, Detroit
Smith, Hinchman & Grylls, Architects

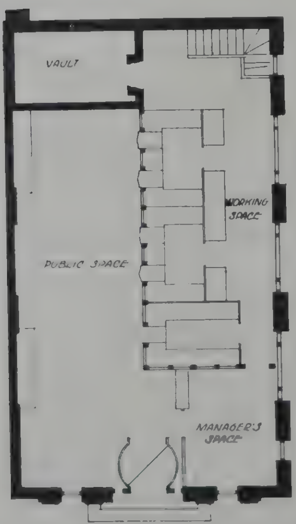
It is the experience of the Detroit banks that most satisfactory results are assured by the establishment of branch banking offices in individual buildings located in the shopping districts contiguous to the homes of the workers, rather than in the manufacturing centers themselves.

The branch bank buildings are usually of brick and stone, fireproof construction, with a story height from 16 to 18 feet.

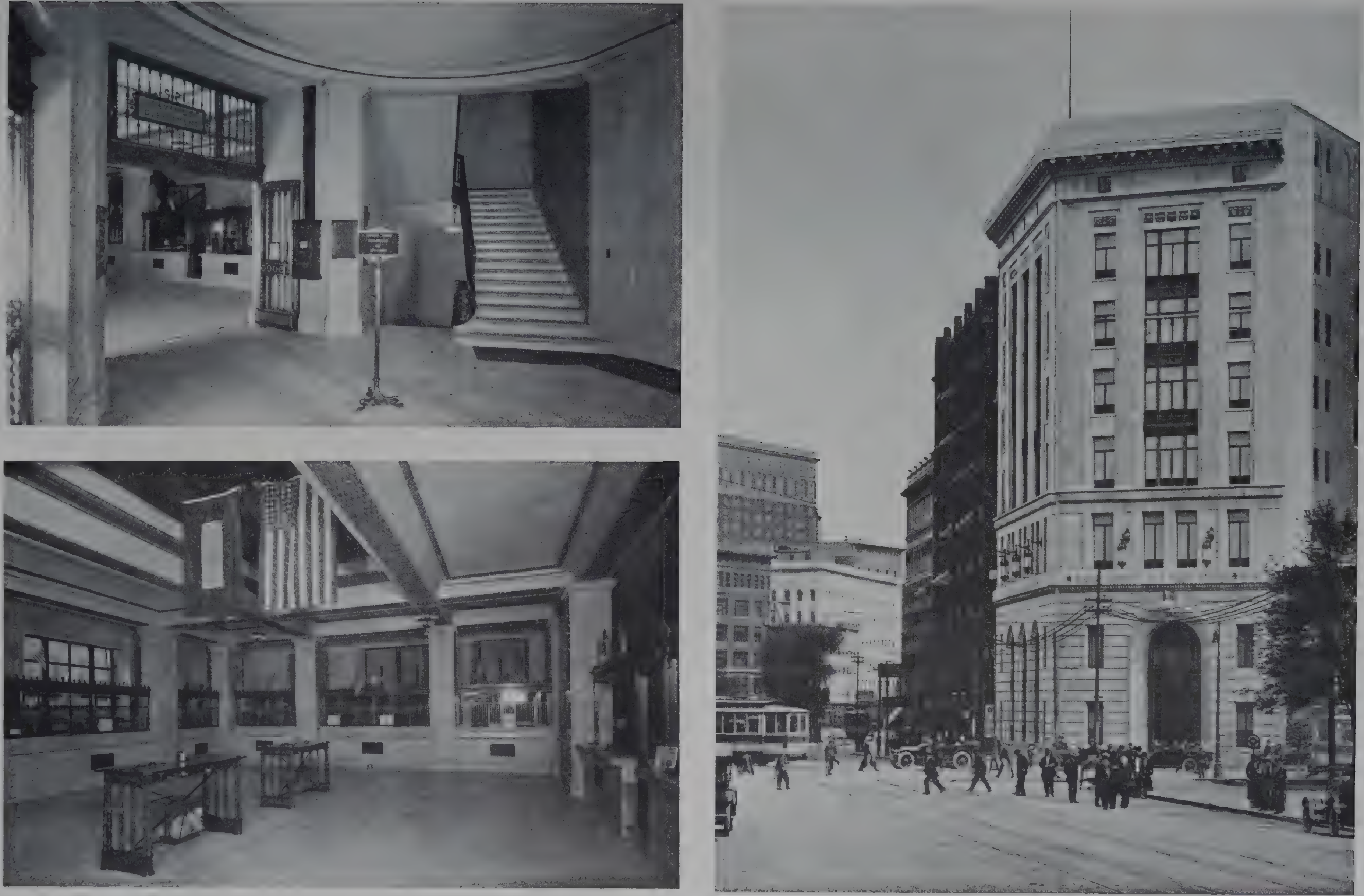
It has been found that in such a building as above described deposits must exceed $300,000 in amount to carry the necessary costs.

Certain of the branch banks favorably located in Detroit have deposits ranging from $2,000,000 to $4,000,000.

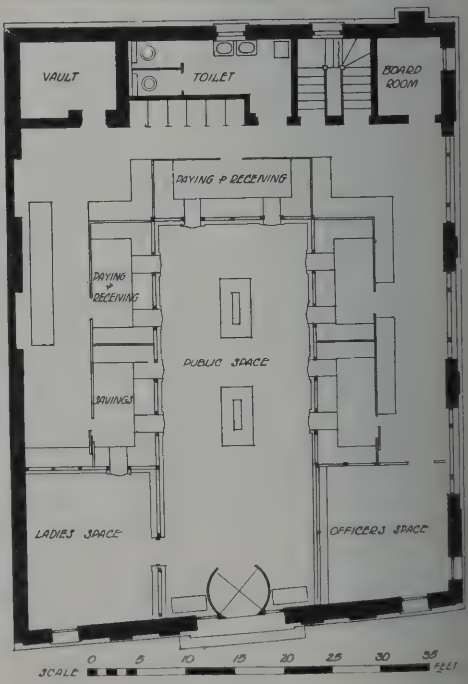
The State Banking Laws of Michigan do not permit more than 50 per cent of the capital stock of State Banks to be invested in buildings and real estate, and this restriction naturally operates against extending branch bank buildings beyond the specific requirements of banking service. Then, too, it is felt that an individual building is a distinct asset, even at an added first cost.



Floor Plan and Exterior, Dime Savings Bank, Grand River Boulevard, Detroit
Smith, Hinchman & Grylls, Architects

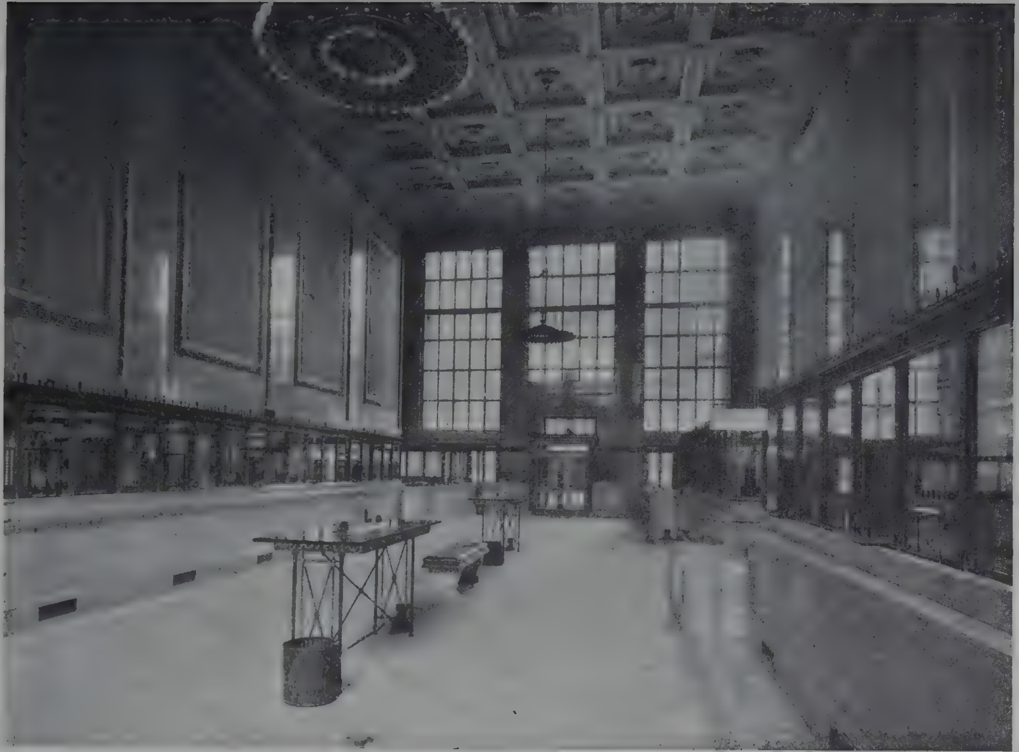


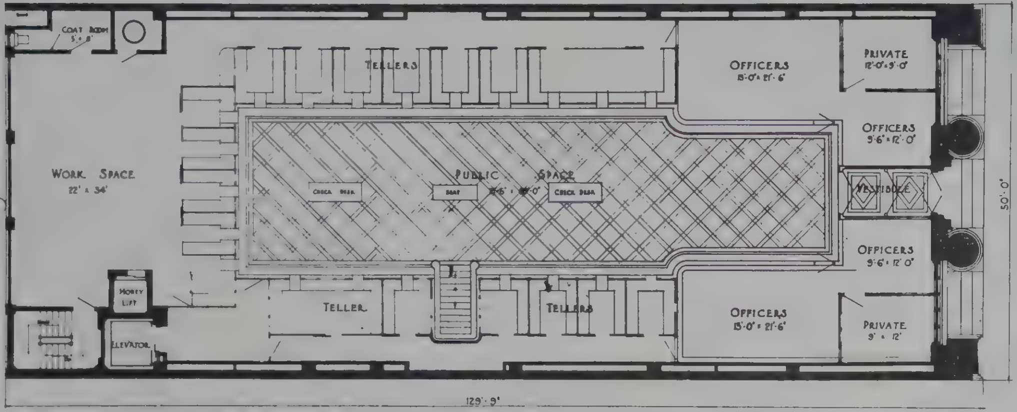
MAIN BUILDING, WAYNE COUNTY AND HOME SAVINGS BANK, DETROIT, MICH.
DONALDSON & MEIER, ARCHITECTS



THIS plan shows the simple typical arrangement of the Detroit branch banks. They usually have corner locations, enabling a well lighted banking room to be provided and also a good expanse of wall surface on the facade.

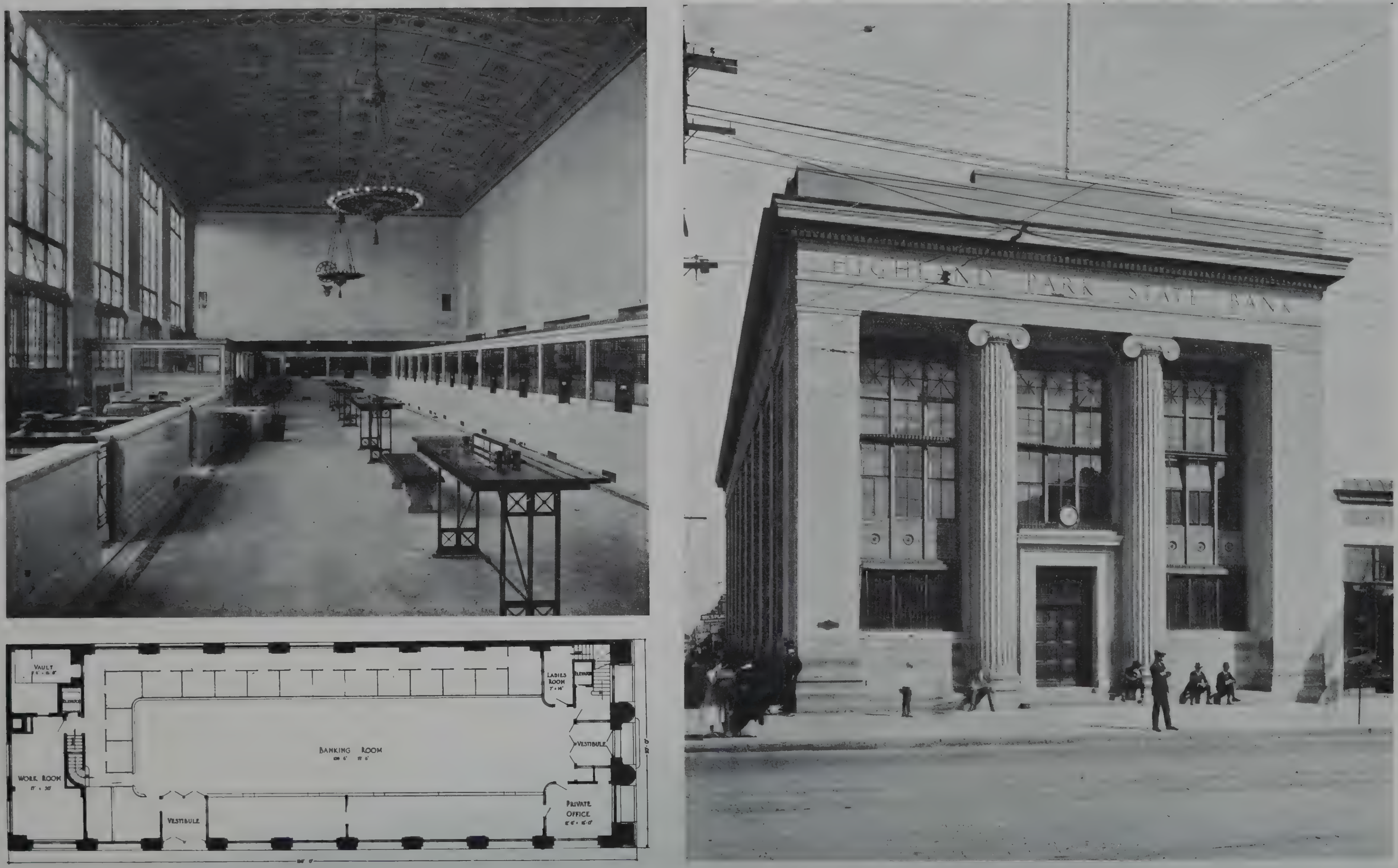
DIME SAVINGS BANK, EAST JEFFERSON AVENUE AND BEAUFAIT STREET, DETROIT, MICH.
SMITH, HINCHMAN & GRYLLS, ARCHITECTS





THE NATIONAL BANK OF COMMERCE, WEST FORT STREET, DETROIT, MICH.

ALBERT KAHN, ARCHITECT



HIGHLAND PARK STATE BANK, DETROIT, MICH.
ALBERT KAHN, ARCHITECT

The Hartford Times Building

DONN BARBER, ARCHITECT

THE Madison Square Presbyterian Church, built in 1906 only to be torn down in 1919 to make way for an office building, was one of the last and probably the best buildings designed by the late Stanford White, of the firm of McKim, Mead & White. In addition to its interest as an architectural composition, this church was particularly noteworthy and epoch making in the fact that it was the first instance in this country where colored glazed terra cotta was used throughout in the architectural members.

When the Parkhurst Church, as it came to be called, was finished it created a great deal of favorable comment, particularly on account of its individuality and extraordinary richness and the unusual fact of its color. Its design has been very closely reproduced in southern California and in one of the large cities of one of the Southern States, and many of its details have been freely copied and reproduced over and over again. It was a building of unusual and strong personality, studied with infinite care as to color and kind of materials employed, skilfully handled and beautifully executed.

Many of our worthy structures in this country, some dating back to Revolutionary days, have been sacrificed in what has come to be called natural progress, and so this famous church — a veritable jewel in design — in its turn has had to make way for the steady march of commercialism.

It was a happy inspiration — when this building was being demolished, and there was the danger if not the probability that most if not all of the beautiful terra cotta detail would be destroyed — that led Donn Barber to grasp the opportunity of preserving the major portion of it, and arrange to incorporate it in the building for the *Hartford Times*, which is to be in no way a reproduction of the church, but a new combination of the old elements taken from the church.

When the *Hartford Times* acquired its very desirable new plot of ground on Prospect street opposite the end of New Atheneum street, a one-block street created between the Morgan Memorial and the Municipal Building, running from Main to Prospect street, it was with the idea of getting a plot sufficiently large to provide a low building for their occupancy in a neighborhood that was centrally located. It was realized that the position of the property required some suitable and commensurate architectural contribution to the neighborhood, situated as it is in the midst of many of Hartford's finest structures. The idea was to provide a simple, dignified, though modest, façade on Prospect street, and instructions were given to the architect to study and present something along these lines.

The building requirements called for a three-story building to show on the Prospect street front, or a wall height of about 40 feet by 180 feet long. A façade was studied along restrained Colonial lines of suitable face brick and sparingly used stone trim, when it was found that the cost of the façade, owing to the increased price of building materials available, was out of all proportion to the slight effect gained.

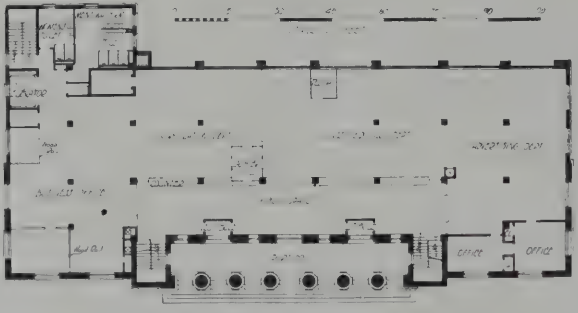
The Morgan Memorial is built of pink Tennessee marble, and the Municipal Building is built of white Bethel granite. The façade of the new *Times* Building is to be seen particularly from Main street at the end of and between these two flanking buildings. To secure an adequate architectural treatment with the limited means at the architect's disposal, was a problem. The solution of it is best described in Mr. Barber's own words:

"It so happened that the proposed *Times* Building, being a commercial building in every sense,

Perspective Showing Location at End of New Atheneum Street

and being a free standing building with light on all sides, admitted of the principal façade being treated more or less independently of the other façades and somewhat as an architectural screen. The plan arrangement and access to the building required merely a generous entrance into a public space on a first floor doing business with the public: access to stairways, corridors and to certain private offices. The lighting of these services was easy to take care of, so that a wide latitude was therefore left in the selection of size and character of openings. All the practical and working end of the building, it was found, could be placed back of this front line of service and amply lighted through the other three surrounding walls.

"At this stage of the problem I learned that the Parkhurst Church with its fine classic portico was being demolished, and I instinctively recalled the beautiful colonnades of Europe at the ends of streets and vistas: the Madeleine and Pantheon, the Chambre de Deputes in Paris, and any number of examples in Italy and elsewhere. To refresh my memory in detail I turned to a photograph of the church and immediately seemed to see a possibility of using the six granite columns and the two granite pilasters, arranged as the porch motif of five bays on the church, into a colonnade motif of seven bays, by bringing the wall pilasters out to a line in the plane of the columns; also with the many running feet of cornice and other members encircling the church, the chance of creating a long, flat composition.

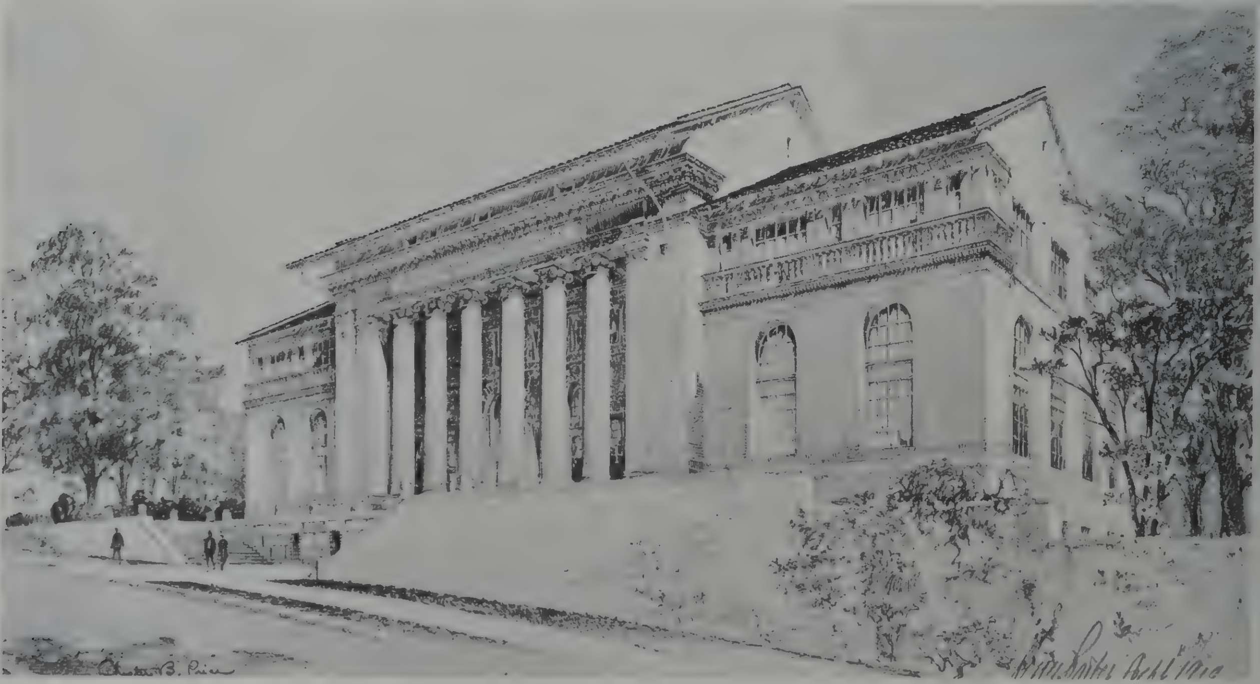


Main Floor Plan

"The wonderfully beautiful and picturesque precedents of the buildings of Italy, where the principal façades are treated frankly as such and backed up by buildings of an entirely different character in design, occurred to me. I went down to the church and satisfied myself that instead of demolishing the building in the usual way, it was possible, with care, to take it down piece by piece, and number, pack and ship the pieces.

"In the design of the new *Hartfora Times* façade, the original columns, pilasters and cornices are used; the steps, platforms and base courses all fitted together as they were originally, with the exception of the change in position of the pilasters. In the back wall of the arcade are used all the principal openings in the church façade. The large circular headed windows on the Twenty-fourth street façade have been used to form circular headed entrance doors, and the other windows on the Twenty-fourth street façade, and the windows under the columns on the Madison avenue façade, and the two side doors, are also all used in a new arrangement in this wall.

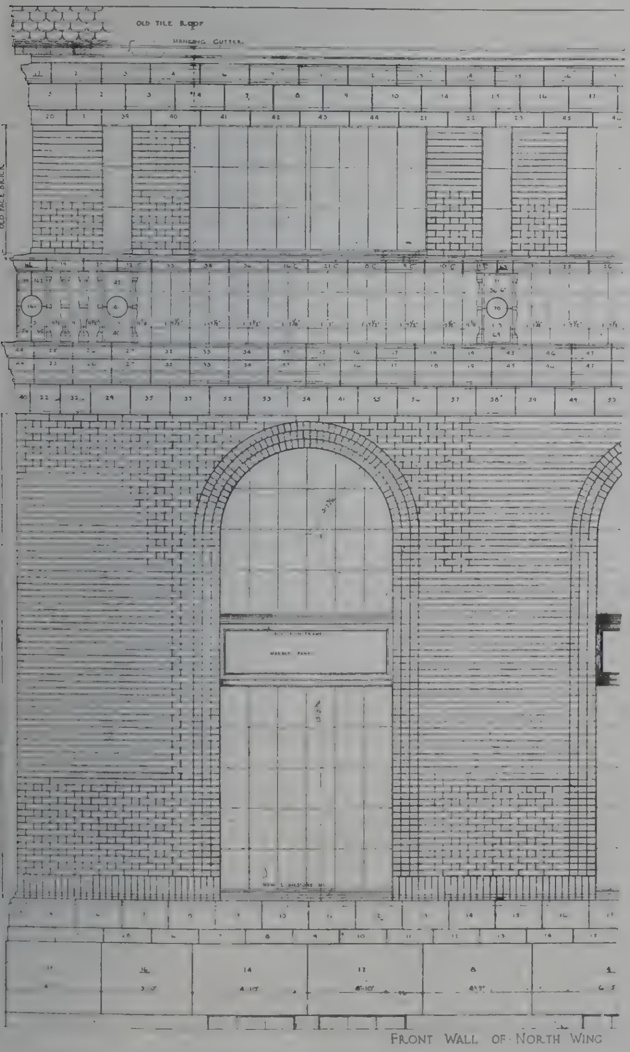
"As the church was being taken down each


Perspective Sketch of Hartford Times Building Showing Solution of Grade Problem

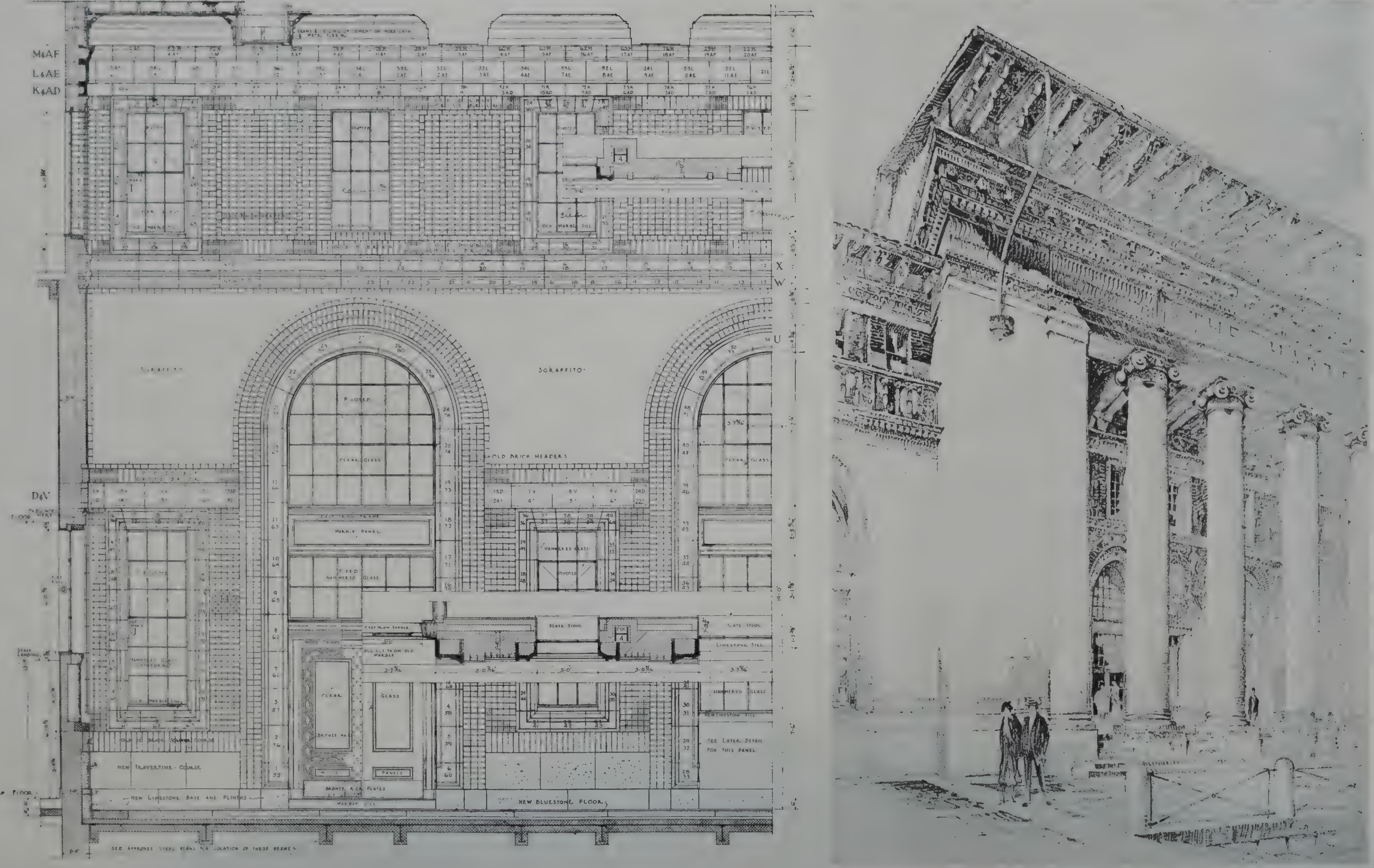
piece of terra cotta was numbered according to an arranged scheme, and although many of the pieces in the new building find themselves side by side as of old, transpositions have been made necessary in many places. For instance, there existed a certain number of definitely designed breaks and right angle turns in the cornice so that I was limited in the composition to these breaks that existed. It was also necessary to recombine the materials without any cutting, since that would have destroyed the spacing of the running ornament. It all happened very quickly, and after the church had been taken down and the materials carefully packed and shipped, we were left with our numbered diagrams and numbered pieces to work with, inflexible in their sizes and their sequence, and certain photographs that had been especially taken. It amounted to a cut-up puzzle of a certain picture with the possibility of creating a new picture of the same pieces. In the new composition the original Corinthian order is changed to Ionic. By the use of an Ionic cap in the order and an added plinth between the column base and pedestal, we were enabled to adjust the height of the order to our established, required story heights.

Madison Square Presbyterian Church from Which Material for Hartford Times Building Was Taken

"It has been an inspiration and a most interesting experience to have been able to preserve and use these gorgeous materials, most of which could in all probability not be duplicated at the present time under the conditions obtaining in the material market. The façade having been arranged for, the other problem was that of placing it in a proper relation of height to the Morgan Memorial and Municipal Building. There is a slight crown to Atheneum street from Main to Prospect street; the Prospect street end of Atheneum is somewhat lower than the Main street end. There is quite a sudden down hill grade to Prospect street from left to right looking from Main. I have therefore taken the water-table line of the Morgan Memorial and the corresponding water-table line of the Municipal Building, which are practically at the same level, and carried these lines across the Prospect street front of the *Times* Building, creating a platform or approach on which the arcade motif of the building is placed. Curiously enough it was possible to carry the balustrade motif around on the level of the balustrade motif of the other two buildings. Tile roofs have been added to increase the height of the building. These with the trees on Prospect street and around the *Times* Building should add tremendously to the color and framing of the picture."



Detail at End of Wing



DETAILS OF ENTRANCE TO HARTFORD TIMES BUILDING SHOWING ADAPTATION OF MATERIAL FROM MADISON SQUARE CHURCH

DONN BARBER, ARCHITECT

Villa Carola

THE RESIDENCE OF MR. AND MRS. ISAAC GUGGENHEIM, PORT WASHINGTON, L. I.

H. VAN BUREN MAGONIGLE, ARCHITECT

THE property on which the Villa Carola is located is a rather narrow and long strip of beautifully modeled land, a large proportion of which is occupied by a private golf course, by thickly wooded areas, and by a group of large service and farm buildings. The new residence and its gardens occupy a relatively small portion, fortunately situated on the highest point of the property which gradually slopes northeast and northwest toward the Sound and Hempstead Harbor. Leading toward this knoll there existed under former ownership a straight road about 1,400 feet in length, bordered on each side in the upper portion by fine locust trees and in the lower portion by maples. When Mr. Guggenheim bought the property this road was abandoned and the roadbed itself grassed over, forming a beautiful, shady, grassy *allée*.

By a most fortunate circumstance the axis of the grassy avenue runs almost due northeast and southwest, and the main living rooms of the house were therefore placed so as to command the southwesterly exposure—an ideal exposure for any house in this climate. On the northwesterly side of the house a forecourt was designed as the termination of the carriage approach, bounded by the façade of the house with a porte cochère on one side, and by the parapet of the house terrace and by box hedges on the others.

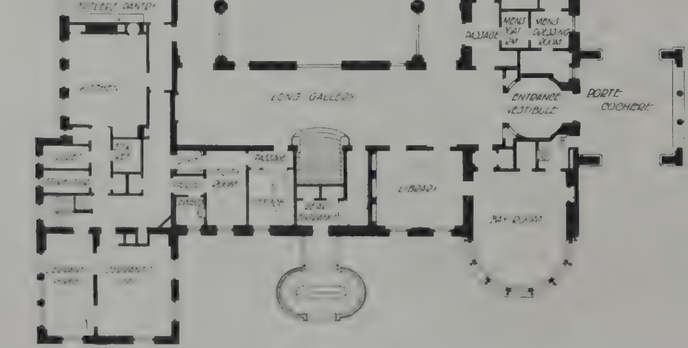
On the southwesterly or living front of the house a broad terrace, shaded at each end by two large elms, forms a well proportioned base. The gardens extend from this terrace to the locust avenue and are divided practically into four parts. The central portion is a broad green sward of the width of the avenue, so that this quiet *tapis vert* is carried up to the foot of the terrace. It is proposed that at the extreme southwesterly end of the avenue a *Tempietto* will be built to emphasize this long axis and terminate the vista beautifully.

On either side of this central green carpet are flower gardens, the axes of which correspond to the axes of the enclosed porches at each end of the southwesterly façade. These gardens have perennial borders, against box hedges on the inside and hemlock hedges on the outside. The hemlock hedges are to be allowed to grow to a considerable height and be trimmed to formal lines so as to form a green wall around the gardens to give them privacy and intimate charm.

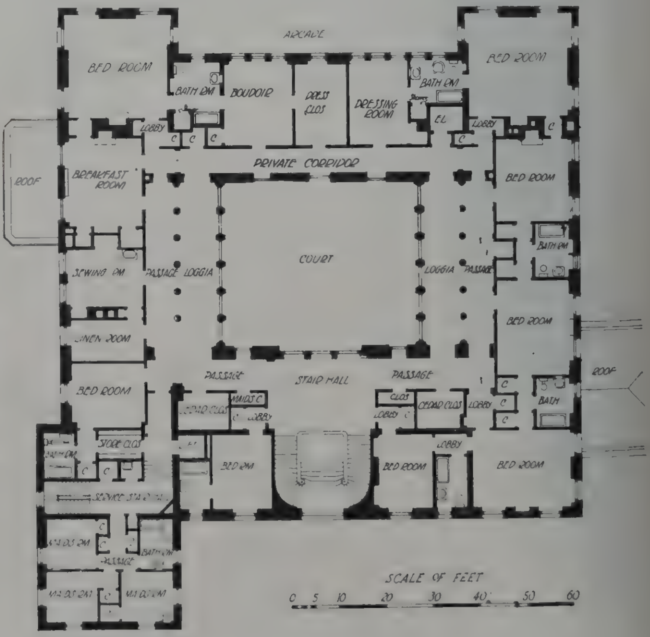
At the foot of the gardens is the fourth portion, which is in reality a lower terrace designed principally to introduce water and rose gardens into the composition. In the center, lying across the axis of the locust avenue and the *tapis vert* is a rectangular pool. At the ends of the pool are two rose gardens. Two wall fountains are erected on

Entrance Front from Approach to Forecourt

the southwesterly side of them on the axes of the main flower gardens. The fountain groups in the niches of the wall fountains were modeled by Mr. F. Landi, who also made, before his death, the sketches for the figures for the pool which were developed in the groups finally modeled by Mr. Chester Beach. From this lower terrace one descends by broad, low steps to the avenue, through lofty antique stone pylons, which accent the junction of the avenue and the garden. The wall fountains and the setting for the pylons were designed by Mr. Magonigle. Vitale, Brinckerhoff

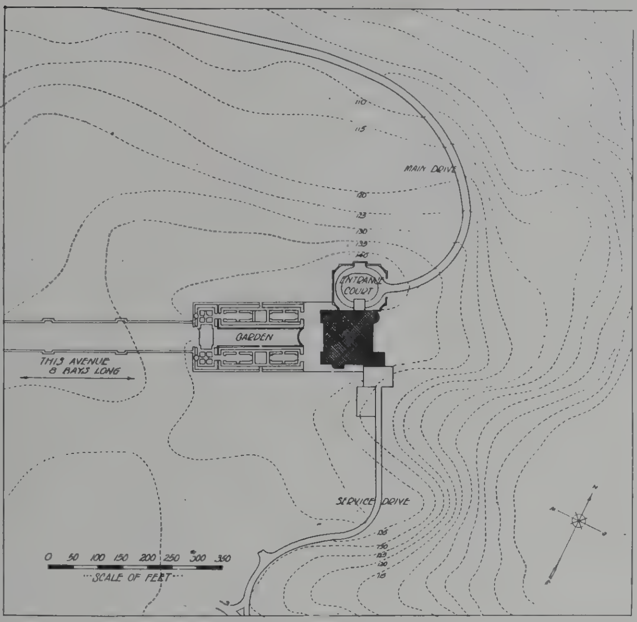


First Floor Plan



Second Floor Plan

& Geiffert were the landscape architects.



Plot Plan in Vicinity of House

In considering the house it is important to understand the factors which suggested and controlled the plan and design. These are to be found in the site, the view, the aspects and prevailing breezes in summertime. Beautiful water views are obtainable from the northeasterly and southwesterly fronts. The prevailing breezes are from the southwest. In order to secure at the same time a free circulation of air through all of the rooms in both stories, and a plan which would be sufficiently compact and give good circulation and easy and rapid service, it was determined to build the house around a *cortile* open to the sky.

The exterior of the house is of brick, accented with terra cotta and marble. The brickwork can probably never be duplicated. The brick used was the accumulation of several years in a large plant, of brick that had not burned true to shade and was therefore not considered usable. They varied in tone from rich brownish purple to a light yellow, through all the intermediate shades of brown and red. It was possible to distinguish thirteen general color groups, each of these groups varying in shade in themselves, and each brick in the sub-groups frequently varying in color from one end to the other. This gave an extraordinary range of beautiful colors; and by carefully calculating the exact proportion of each of the thirteen general colors which would produce the big, general tone desired for the wall, taking into consideration also the width and color of the mortar joints to be

View of Tower on Easterly Corner

FAIENCE FOUNTAIN AND LONG GALLERY DOOR IN THE INTERIOR COURT
H. VAN BUREN MAGONIGLE, ARCHITECT; ROBERT AITKEN, SCULPTOR

used, it was possible to predetermine the general color tone of the wall, which is at a distance a warm reddish brown, but on a closer view is seen to be composed of numerous units of beautiful shades. The brick is what is known as wire-cut with a scratched surface and then rerolled. This gives a rough surface texture of unusual beauty and quality. The brick is laid in Flemish bond, the stretchers being used as headers, and two stretchers with a dry joint between forming one long stretcher. The joint is of grit cement mortar toned to a deep cream.

The color and finish of the terra cotta were determined upon, after numerous experiments, to harmonize with the general color tone of the brickwork. The backgrounds of the ornamental portions are treated with polychrome glazes in a novel and interesting manner.

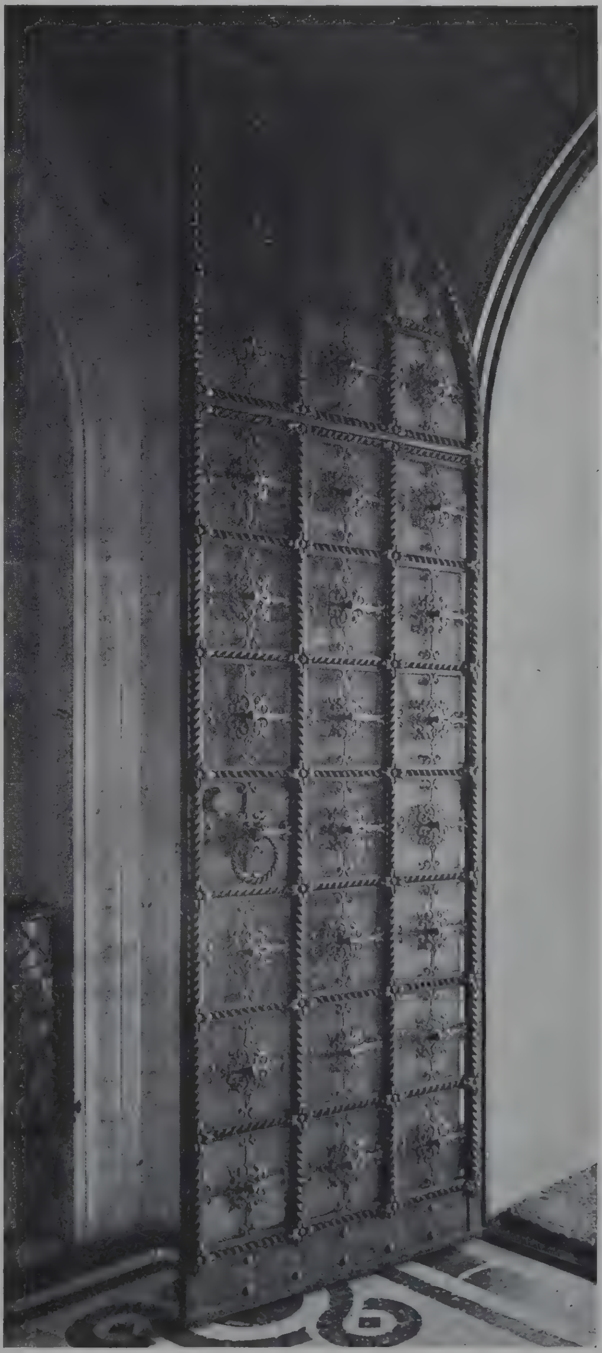
The marble columns in the loggias, porte cochère and the exterior arcade in the second story of the southwesterly front were all selected of white marble of various tones and veinings, and then stained with a ferric stain, producing a golden tone that harmonizes them with the general tone of the house.

The overhanging eaves of the roof, which is fireproof, are cased with cypress beams. The roof itself is covered with pan-and-roll tiles specially designed and manufactured for this house. The colors of the tiles are varied and reproduce in a generally warmer tone the color of the brickwork. Some green glazes are introduced here and there to give the effect of a mossy old roof.

The walls of the entrance vestibule are of travertine and the floor of marble inlay. The decorative painting of the ceiling, which is so designed as to carry up through it the character and color of the faience corners, is by Herman T. Schladermundt. The cornice and ceiling ribs are of cypress with aluminum powder rubbed into the grain of the wood and decorated in gray and yellow. The panels between the ribs are of plaster; the central panel of the ceiling is of decorated glass painted with the signs of the zodiac, through which the vestibule is lighted.

The Long Gallery, carried out in early Italian style, has a marble floor. The walls are of travertine with a fine, sand rubbed finish. The two doors at each side of the main staircase are of Italian walnut, carved. The remaining doors were decorated by Herman T. Schladermundt, who also decorated the ceiling which is Siennese in character in black, white and red. Between the brackets supporting the cross ribs are panels in red, black, blue and white in heraldic devices. This painting is done upon cypress treated with muriatic acid and then burned with a plumber's torch, and the soft grain brushed out, leaving the harder parts of the wood to form a dark tracery on the light ground.

The loggias at each side of the court connect the living rooms, which are on the southerly and westerly sides of the house, with the Long Gallery. They open into the court with three large arches which are glazed and have borders of painted glass. At the ends of each of these loggias are panels in which doors occur, and around these door openings are mural decorations painted by Edith Magonigle.



Detail of the Main Entrance Doors
One of Two in Wrought Iron and Glass

The walls of the court are of stucco; the string course at the second story level and the coping at the top are of white Vermont marble. The marble columns in the loggias in the second story are of Vermont marble, and toned with a preparation which makes them harmonious with the warm cream of the stucco walls.

The fountain basin in the center of the court is lined with blue, green and blue gray tiles. The outer rim of the basin is of North River bluestone. The fountain group, representing a satyr carrying away a mermaid, is by Robert Aitken and is executed in colored faience. The four grotesque bronze animals spouting water are also by Mr. Aitken. Under the balcony is a searchlight which throws a beam of light on the fountain at night, and in each corner of the court is an electric outlet for lights in the court on festal occasions.

The service portions of the house were given a large amount of study in order to provide labor-saving arrangements and make housekeeping easy. For example, the doors throughout are laminated, and with no panels or mouldings to catch dust. The door trims are perfectly plain without mouldings and with rounded edges. The windows have no trim at all, but the plaster turns into the jambs and heads with rounded angles. The hardware is of solid white metal with white porcelain knobs. The hallways and passages are tiled to a height of 5 feet and have a sanitary base. Along the top of the tile wainscoting is a 2-inch band of black paint so that when the rounded ledge of the wainscot is dusted, there will be no dirt mark on the wall. All of the interior and exterior corners of floors, walls and ceilings are rounded. The floors are of plastic linoleum, which is carried up the service stairway. Around all of the service rooms, including the servants' bedrooms and closets, are white tile bases with white tile plinths under the wood trims, and the saddles are of white marble.

The kitchen walls are tiled to a height of 8 feet and above that are enameled plaster. The sinks are of white metal.

The refrigerating machinery room, which has an ice-cream freezer electrically operated, as well as a machine for making ice for the table, has the walls insulated with sound-proofing material. This is true also of the room in which the elevator machinery and the vacuum-cleaning machinery is enclosed. The vacuum cleaner is connected through piping with all parts of the house, and dust is washed away into the drainage system outside of the house. The heating plant consists of a range of three boilers so that one or more may be operated according to the state of the thermometer. The heating in the main portion of the house is by indirect steam, and the temperature is controlled by thermostats located in every room.

Vista from the Garden Terrace
Vitale, Brinckerhoff & Geiffert, Landscape Architects

VIEW OF GARDEN FRONT ACROSS THE POOL

HOUSE OF MR. AND MRS. ISAAC GUGGENHEIM, PORT WASHINGTON, LONG ISLAND, N. Y.

H. VAN BUREN MAGONIGLE, ARCHITECT

VITALE, BRINCKERHOFF & GEIFFERT, LANDSCAPE ARCHITECTS

DETAIL ON GARDEN TERRACE

HOUSE OF MR. AND MRS. ISAAC GUGGENHEIM, PORT WASHINGTON, LONG ISLAND, N. Y.

H. VAN BUREN MAGONIGLE, ARCHITECT

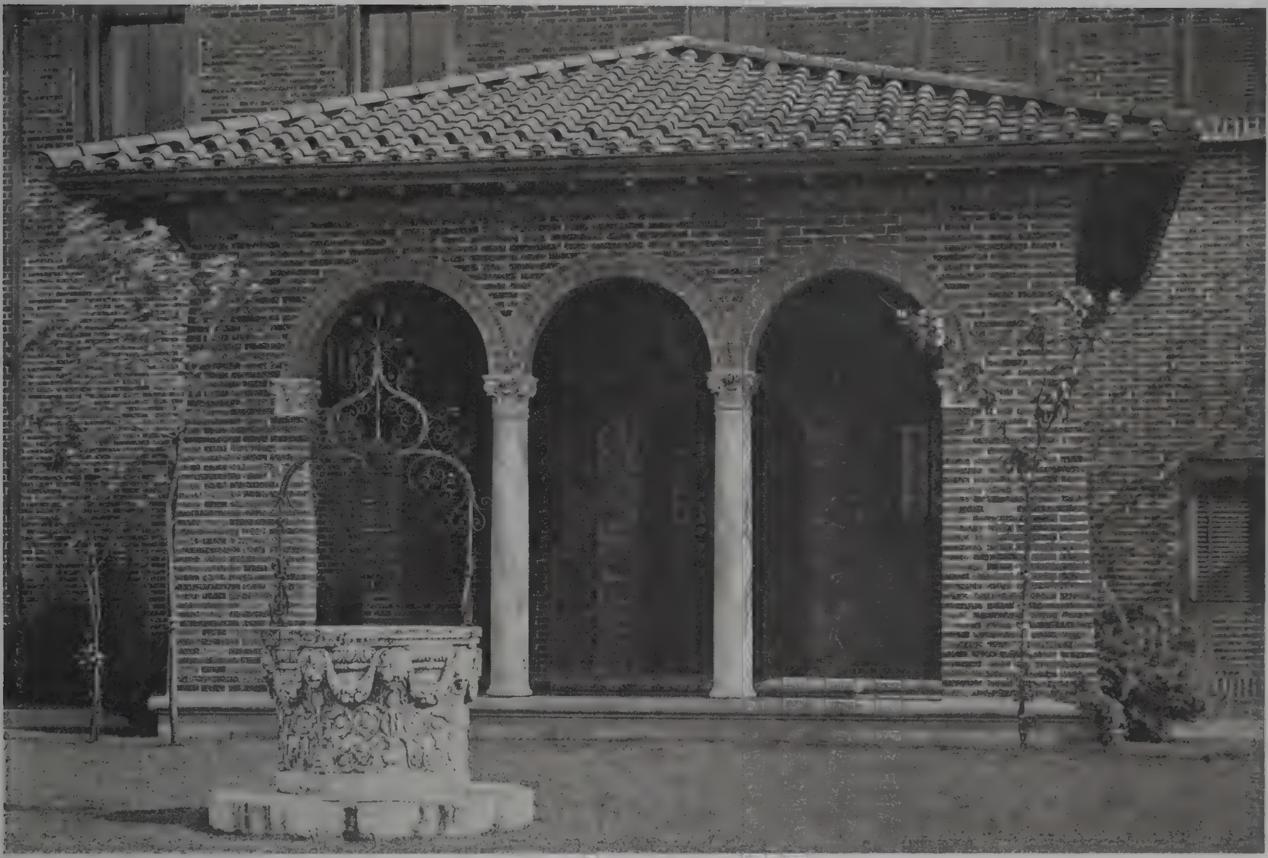
VITALE, BRINCKERHOFF & GEIFFERT, LANDSCAPE ARCHITECTS

DETAIL OF BAY ROOM EXTERIOR

DETAIL OF DINING ROOM BAY

HOUSE OF MR. AND MRS. ISAAC GUGGENHEIM, PORT WASHINGTON, LONG ISLAND, N. Y.

H. VAN BUREN MAGONIGLE, ARCHITECT



EXTERIOR DETAIL OF PORTE COCHERE

DETAIL OF ENTRANCE FROM PORTE COCHERE

HOUSE OF MR. AND MRS. ISAAC GUGGENHEIM, PORT WASHINGTON, LONG ISLAND, N. Y.

H. VAN BUREN MAGONIGLE, ARCHITECT

DETAILS OF POOL AT END OF AVENUE OF TREES

HOUSE OF MR. AND MRS. ISAAC GUGGENHEIM, PORT WASHINGTON, LONG ISLAND, N. Y.

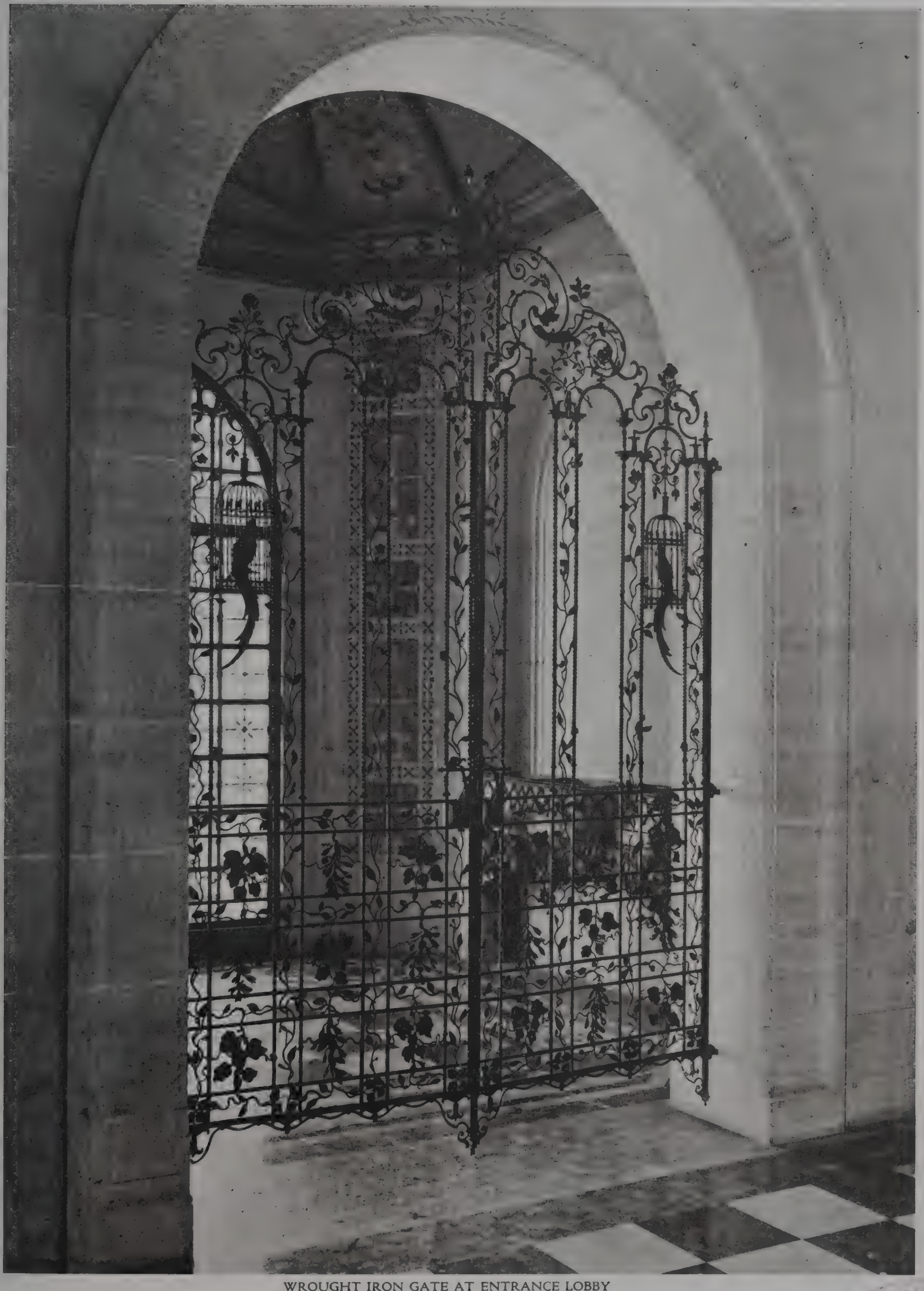
H. VAN BUREN MAGONIGLE, ARCHITECT

VITALE, BRINCKERHOFF & GEIFFERT, LANDSCAPE ARCHITECTS

VIEW OF INTERIOR COURT

HOUSE OF MR. AND MRS. ISAAC GUGGENHEIM, PORT WASHINGTON, LONG ISLAND, N. Y.

H VAN BUREN MAGONIGLE, ARCHITECT
ROBERT AITKEN, SCULPTOR



WROUGHT IRON GATE AT ENTRANCE LOBBY

HOUSE OF MR. AND MRS. ISAAC GUGGENHEIM, PORT WASHINGTON, LONG ISLAND, N. Y.

H. VAN BUREN MAGONIGLE, ARCHITECT

FOUNTAIN AND AQUARIUM IN SUMMER DINING ROOM

HOUSE OF MR. AND MRS. ISAAC GUGGENHEIM, PORT WASHINGTON, LONG ISLAND, N. Y.

H VAN BUREN MAGONIGLE, ARCHITECT

STAIRWAY WINDOW

GALLERY DOOR TO COURT

HOUSE OF MR. AND MRS. ISAAC GUGGENHEIM, PORT WASHINGTON, LONG ISLAND, N. Y.

H. VAN BUREN MAGONIGLE, ARCHITECT

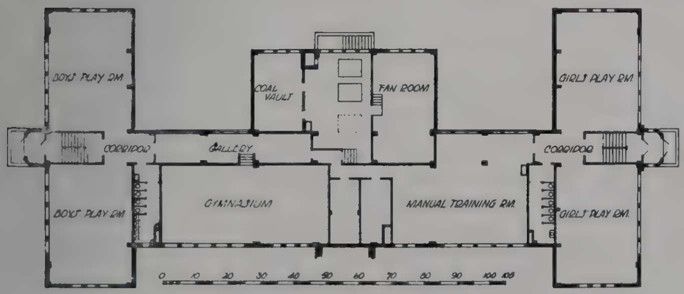
VIEW ACROSS GALLERY SHOWING LIBRARY DOOR
Decorated by Herman T Schladermundt

DOORWAY TO ORGAN LOBBY FROM LOGGIA
Decorative Painting by Edith Magonigle

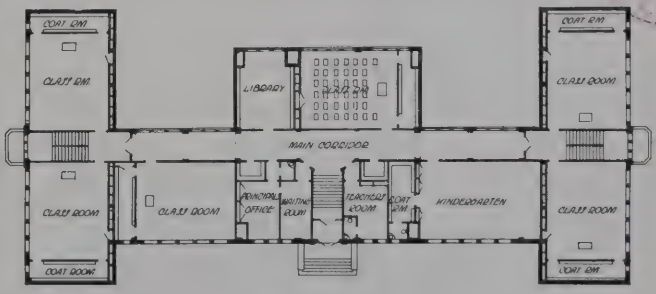
HOUSE OF MR AND MRS. ISAAC GUGGENHEIM, PORT WASHINGTON, LONG ISLAND, N. Y

H. VAN BUREN MAGONIGLE, ARCHITECT

VIEW OF MAIN FRONT



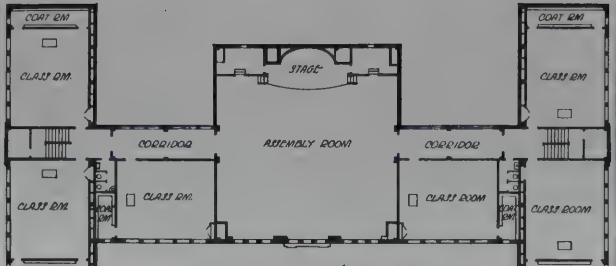
BASEMENT PLAN



FIRST FLOOR PLAN

EVERGREEN AVENUE GRAMMAR SCHOOL, PLAINFIELD, N. J.

WILDER & WHITE, ARCHITECTS



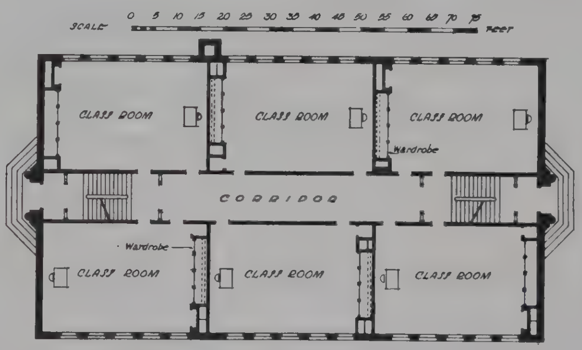
SECOND FLOOR PLAN

SIDE ENTRANCE

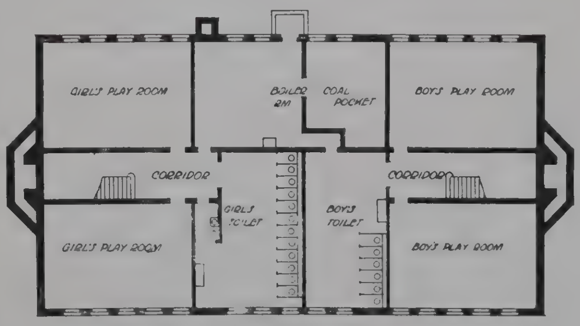
MAIN ENTRANCE

EVERGREEN AVENUE GRAMMAR SCHOOL, PLAINFIELD, N. J.

WILDER & WHITE, ARCHITECTS



FIRST FLOOR PLAN

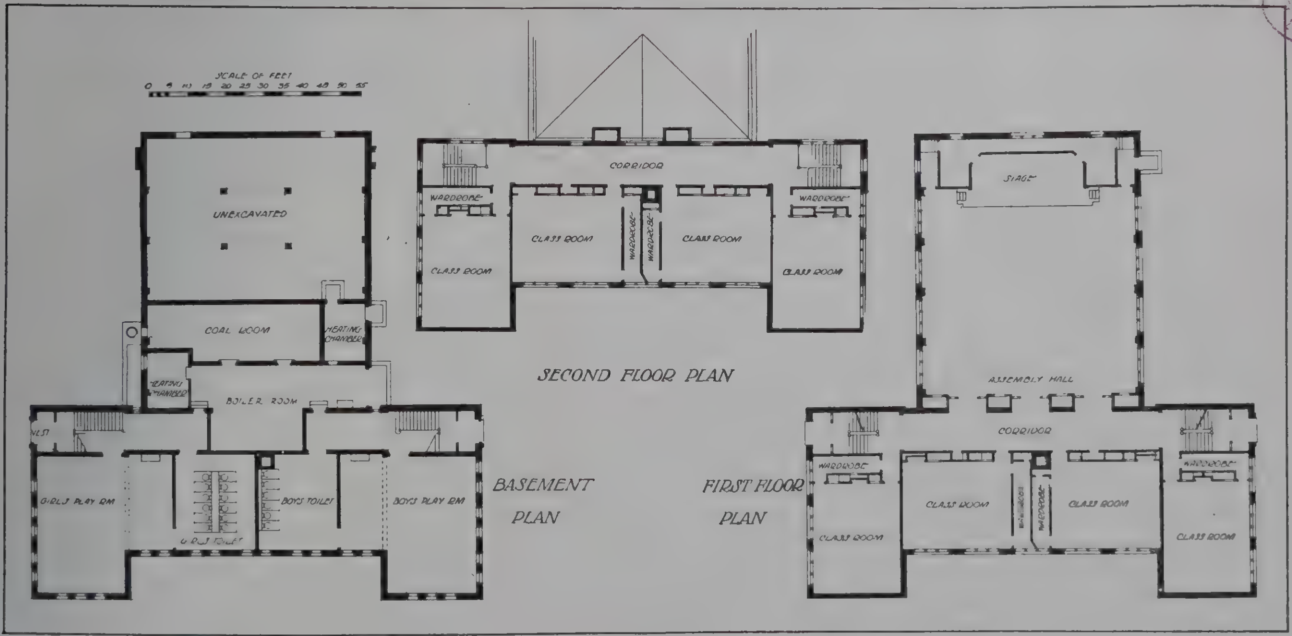


BASEMENT FLOOR PLAN

GENERAL VIEW OF EXTERIOR

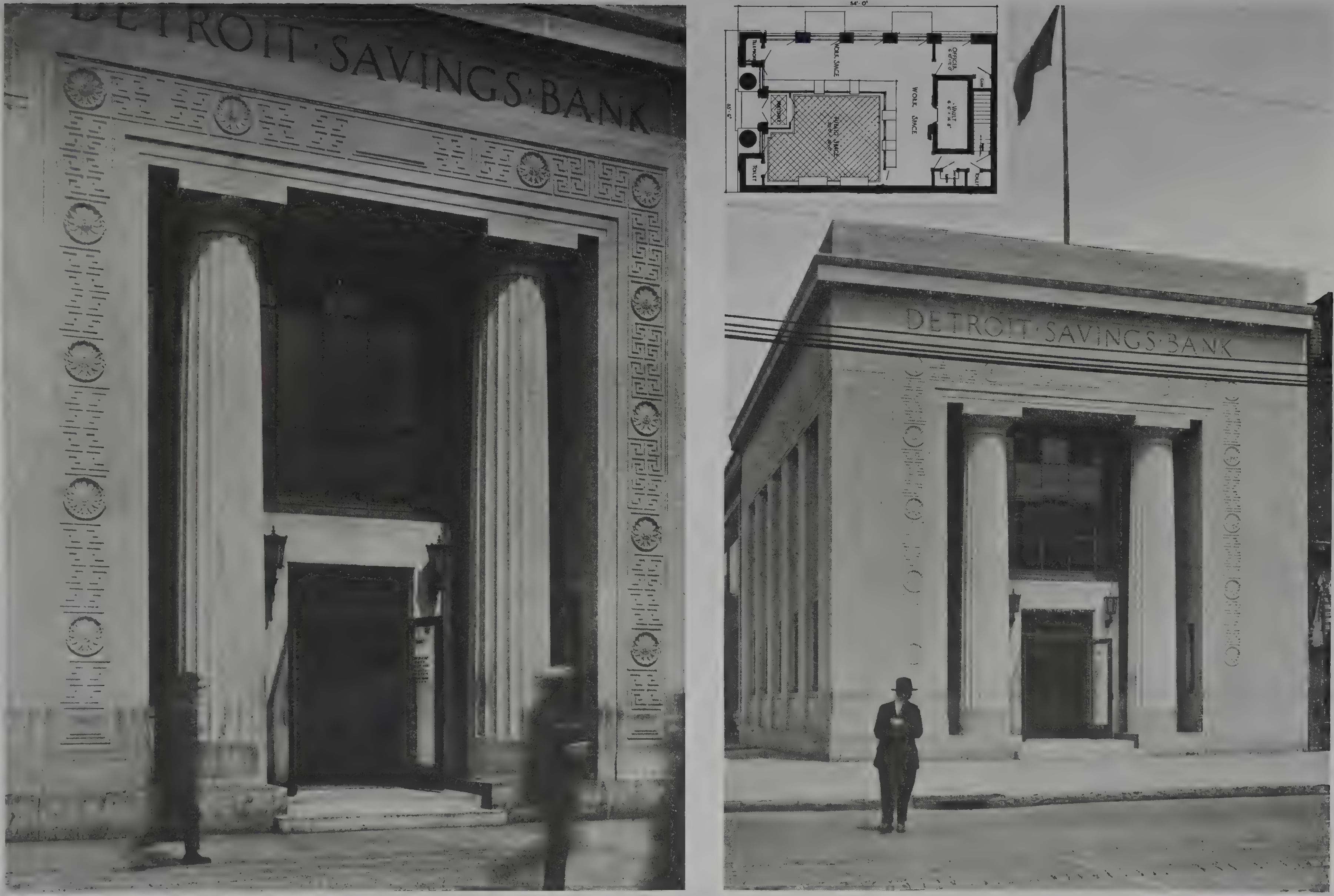
OUR LADY OF LOURDES PAROCHIAL SCHOOL, JAMAICA PLAIN, MASS.

MAGINNIS & WALSH, ARCHITECTS



ST MARY'S PAROCHIAL SCHOOL, WINCHESTER, MASS.

MAGINNIS & WALSH, ARCHITECTS

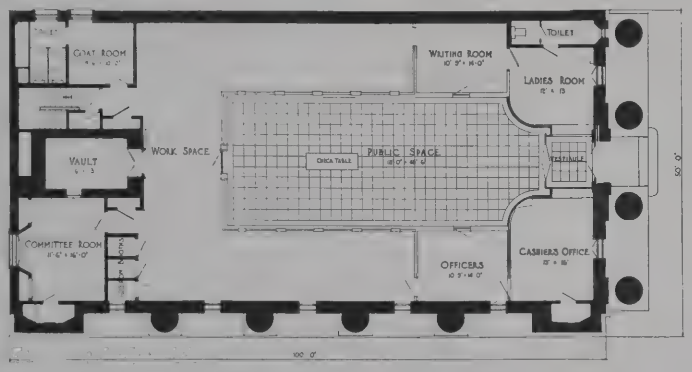


DETAIL OF DOORWAY AND GENERAL VIEW OF EXTERIOR

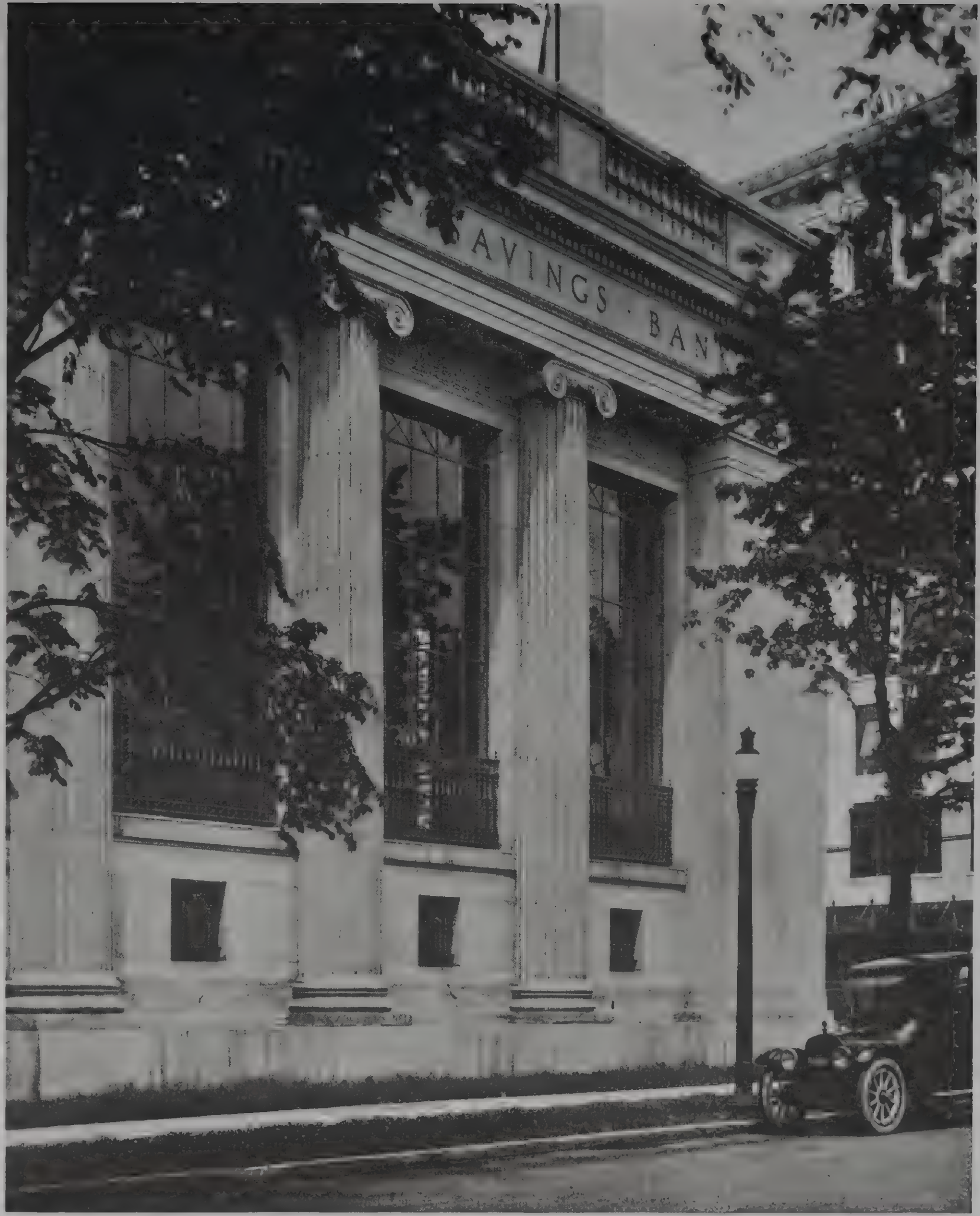
DETROIT SAVINGS BRANCH BANK, WOODWARD AND MILWAUKEE AVENUES, DETROIT, MICH.

ALBERT KAHN, ARCHITECT

GENERAL VIEW OF EXTERIOR



· FIRST · FLOOR PLAN ·



WAYNE COUNTY AND HOME SAVINGS BRANCH BANK, WOODWARD AVENUE AND WEST GRAND BOULEVARD, DETROIT, MICH.

ALBERT KAHN, ARCHITECT

Domestic Architecture of California

ILLUSTRATING THE INFLUENCE OF THE SPANISH AND ITALIAN RENAISSANCE

PART II

By WILLIAM WINTHROP KENT

CLOSELY resembling the works of other Californian architects farther north, yet differing from them in some ways, is that of the more southern men who have practised in and near San Diego and its neighboring villages and towns. Climate, tradition and site, as well as available materials, influence somewhat the designs in this section as they do elsewhere. Wood is more expensive than in the earlier days, hence hollow brick and concrete are seen in place of it.

The interior court is often open on one side for a purpose, and when the house is near the sea, the lines are kept low and long, the roof flat, the walls fairly thick and with fewer openings on the stormy side toward the Pacific, while the court walls are more freely perforated.

At Coronado the house designed by Elmer Grey is placed to secure the best views and protection from the stormy ocean winds, the patio being only open on the garden side, this garden being so beautiful that it could not well be excluded by a fourth walled side to the court at the rear. In this house we see the Spanish characteristic of profuse ornament concentrated about the doorways and windows in contrast with the plain blank walls.

Here, also, is the house of Gen. J. H. Pendleton, of more Italian than Spanish character, in an L-shaped plan of which the entrance is nearly central on the reentrant angle of the elevation on the side opposite to that shown.

At Pasadena and Los Angeles, and in certain houses of even more northern places, we find a strong development of Spanish colonial art; but the plans are often not influenced by the fact of great summer heat, inasmuch as they are usually built for winter residences for Easterners.

An interesting point in many modern Californian houses is the mingling of Italian with Spanish design in both mass and detail. Even in plan, also, is seen a retrospection to even older classic forms, although there is nothing very purely Greek about any which I have seen. But just as in Spain, where in the old work we can occasionally detect the Italian in plan and even in pronounced detail, so we see it here blended with the Spanish by moderns. Hence

First Floor Plan and View, House at Coronado
Elmer Grey, Architect

Houses near Oak Knoll, Pasadena

Reginald D. Johnson, Architect

Marston & Van Pelt, Architects

House of Gen. J. H. Pendleton, Coronado

F. P. Allen, Architect

comes an added appeal to our interest, because from the mingled Spanish and Italian or classic, modified by locality, will possibly spring a style both practical and beautiful as we find it in the work of George Washington Smith, Irving J. Gill, James Osborne Craig, Reginald D. Johnson and other Californian practitioners. Fairly it can be said that it is almost here now, this simple new style, and it promises to grow, improve and possibly remain, although the latter is doubtful.

Oak Knoll, a suburb of Pasadena, is one of the most charming residential districts in California, for here there are few designs that affront and many that add to the varied natural beauties of the locality. Even on approaching it the influence of good design is seen in a group of houses situated on an estate which practically marks the entrance to Oak Knoll.

One of the best pieces of domestic architecture in Pasadena is the house of Mr. Rice, designed by the owner. There is a fine arcade and formal garden, pergola and pool, quite Italian, at the rear.

In South Pasadena, Dr. Behr's house suggests the Villa Paradiso at Genoa, but only because of the loggias which are a necessary feature for views and coolness in this lowland situation. Near by the Coppell residence, illustrated in the preceding article, shows in plan no attempt to shut out the heat (which its walls help to do), because it is a winter home; but the contrast of profuse ornament with a firmly hand-troweled, plain plastered wall is one of its many beautiful features. It shows that certain principles which Mr. Goodhue emphasized at the San Diego Exposition, he pursues in later designs. The Dater house at Montecito has the good qualities of both the Spanish and the Italian school. It is hard to analyze the great charm of this house, but the logic of its plan is perhaps one strong factor added to its quaint suggestion of the greater peasant house of northern Italy, as we find it in old prints and in reality.

The old Country Club at Montecito, now remodeling for a dwelling, is notably picturesque and yet formal enough for its original purpose. Here the

House of Dr. Behr, South Pasadena

Reginald D. Johnson, Architect

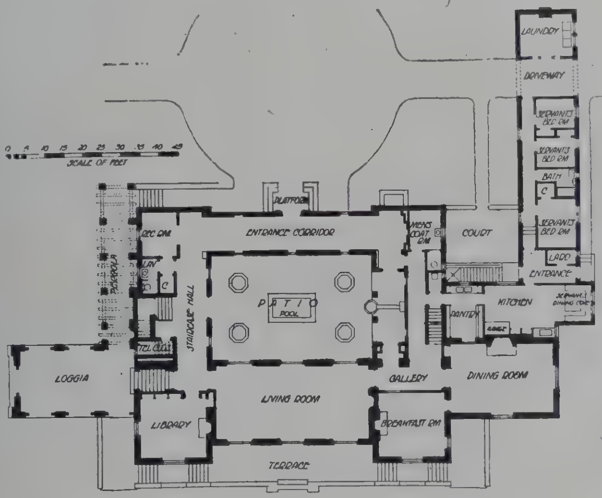
House of L. G. Rice, Esq., Pasadena

Designed by Owner

View from Approach View from Garden

House of Henry Dater, Esq., Santa Barbara, Bertram Grosvenor Goodhue, Architect

Spanish court is of an unusual design in its wall of a polygonal plan, making one of the best façades in Montecito; but the architect has done equally good work in the patio elevation toward the pool and entrance hallway for Mrs. Oakleigh Thorne's house just completed. This is evidently based on Vignola's Casino at Caprarola, but not as successful in its elevation toward the road.



Main Floor Plan

Not far from Santa Barbara Mission is the house of Mr. Vaughn, with fronts on street and garden, where a terrace is reached from low windows. The second story pergolas on the flat roofs of the wings give it an individual character. Adjoining is Mrs. Dennison's house, with an entrance from the court in front, although the rather coquettish niches in the street wall somewhat destroy the

Living Room in House of Henry Dater, Esq., Santa Barbara
Bertram Grosvenor Goodhue, Architect

The Dennison House, Santa Barbara

The Vaughn House, Santa Barbara

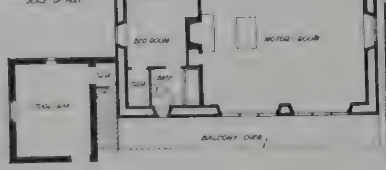
Messrs. Ray & Soule, Architects

The Taylor House, Claremont
Louis C. Mullgardt, Architect

straightforward quality of the rest of the design. Here the climate only suggested a cool porch or two in the rear, a walled garden and pepper trees for shade.

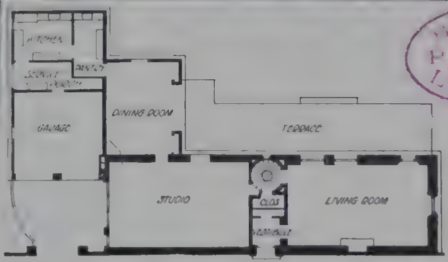
The garage and gardener's cottage by James Osborne Craig, and the house for Mr. George Washington Smith speak so eloquently of picturesqueness, that it is only necessary to add that in them both is the germ of hope for future Californian architecture. The former will eventually have a walled motor courtyard added in front of the two motor doors of the plan. The slope of the ground and the existing, fine large trees had much to do with the arrangement of the plan.

Mr. Smith's house needed no windows on the west or entrance front, hence a beautiful expanse of blank wall accentuates the entrance and the simple windows above, while the garden and garage wall and gate prolong the lines of the elevation. On the east and south the garden and the main living rooms are in the full sunshine so necessary in this part of California in winter, the dining room enjoying sunlight even at midday, while in summer it is in shade. The circular stair is properly a small one and planned for economy of space, as it leads only to two rooms and baths. The studio has a high, north window, and a south window opens on the terrace. This plan and elevation are based on Andalusian Spanish of the twelfth century, as closely, Mr. Smith says, as modern life will admit, and has proved to be practical and of great charm for



Lower Floor Plan and View, Gardener's Cottage and Garage of Mrs. Theodore Sheldon, Santa Barbara
James Osborne Craig, Architect

VIEW FROM THE GARDEN AND SECOND FLOOR PLAN



ENTRANCE FRONT AND FIRST FLOOR PLAN

HOUSE OF GEORGE WASHINGTON SMITH
MONTECITO, CALIF.
GEORGE WASHINGTON SMITH, ARCHITECT

House of Mrs. Oakleigh Thorne, Santa Barbara
Francis W. Wilson, Architect

Southern California. The design is primitive, relying on form, mass and line for its beauty, and I know of no more delightful dwelling for its situation nor one which so invites by its plan and general design. Simplicity is here properly used as a foil for good detail both inside and out.

In Claremont, on San Francisco Bay, the Taylor house is of a fine type. Of all modern Californian designs for large country houses of a distinctly original sort, Mr. Mullgardt's are on the whole the most satisfactory. The promise of his work in "The Court of Nations" at the San Diego Exposition is well fulfilled. This house of Mrs. Taylor, based on Spanish motives, might be called Thibetan. It is not unlike the temple of the Grand Lama and Lhassa, but it is not Thibetan except as the Thibetan has a Chinese air, which faintly pervades this hillside villa and its gardens. These being on a hilltop do not lose their privacy, although enjoyable also by the passerby.

Entrance Hall, House of Mrs. Oakleigh Thorne, Santa Barbara

So, in California, as elsewhere, we see how much climate, site, materials and tradition influence both elevations and plans. Undoubtedly the simplicity noted is, as Mr. Goodhue has written me, in a measure the result of trying to design to meet the lack of skilled labor, and proves often a blessing instead of a hindrance to art. Certainly it is true that where tradition is not too much neglected and materials are sensibly employed in a logical plan, no great harm can come from the lack of highly trained craftsmen in country-house work. This is proved in Bermuda and elsewhere.

North of San Francisco the Spanish and Italian vein runs out, and in some places the architecture of an entire village reminds one of New England. What little foreign influence is traceable is not of as great importance as that in the southern examples; but as wealth increases it is probable that also the upper part of this wonderful state will see considerable improvement in design, to which both Spanish and Italian characteristics will somewhat contribute. The seven hundred and eighty miles of California nevertheless show a consistency in architectural development and a vigorous local style unapproached in any large section.

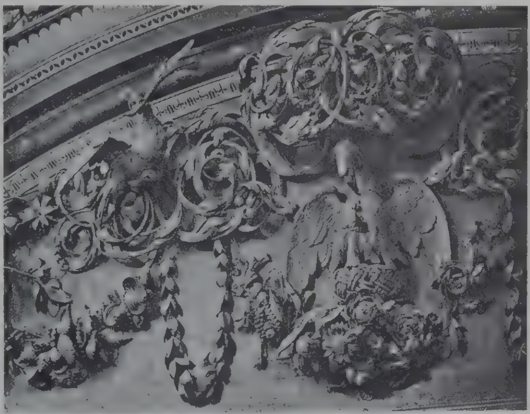
Interior Decoration

ENGLISH FURNITURE OF THE WILLIAM AND MARY PERIOD

By CARL S. JOHNSON

THE forms of both architecture and furniture that immediately succeeded the Renaissance have a peculiarly interesting quality in practically all countries where the inspiration of the Renaissance was felt. The period, which is generally classified as Baroque, was characterized principally by a reaction from the classic feeling and orderly development of the Renaissance; it was an expression of the Romantic idea, and before its full exuberance was developed, and it still remained under the conservative influence of the Renaissance, much good work was done that has a wide appeal for us of to-day and is capable of furnishing valuable precedent for much modern work.

In England, particularly, is a study of the Baroque both interesting and profitable. With the restoration of Charles II there was provided an opportunity for the display of fashion, gaiety and sumptuousness that had previously held sway on the Continent. The classic spirit of the Renaissance school was, however, strongly upheld by such architects as Wren, and the general influence on architecture was, as a consequence, dominantly classic. The Baroque tendency exhibited itself only in the enrichment of classic forms of doorways, mantels and stairways. The sizes of rooms were increased and the ceilings made higher; paneling was designed to accord with this larger scale; the detail of mouldings was vigorous, and the interest in



Detail of Pelican and Whirling Scroll in a Fine Example of Grinling Gibbons' Work

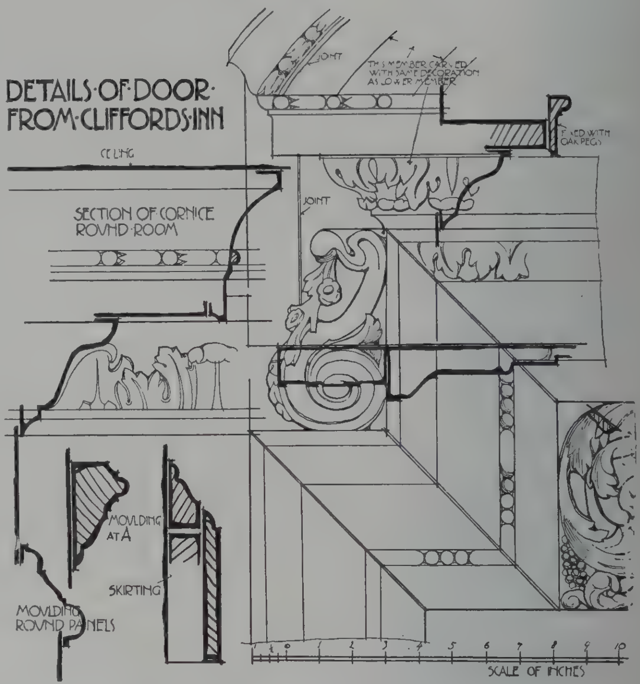
Dining Room in Residence of Mrs. S. R. Hitt, Washington, D. C.

Illustrating a modern treatment of early eighteenth century English type. The broad panels, overdoor ornamentation and wood carving are characteristic of the period. The furniture is a variant of the later Queen Anne style

John Russell Pope, Architect

wood carving as decoration increased, bringing about the use of softer and more suitable woods for carving than oak, culminating in the marvelously adroit and decorative carving of Grinling Gibbons.

The interiors of this period are characterized by great stateliness, but withal giving a comfortable, homelike appearance. The walls were boldly paneled, with careful thought given to the spaces to be filled; the mouldings were frequently enriched with carving and in many cases decorated with gilding; the ceilings of the finer houses were painted with gay, mythological subjects, the most famous decorator of which was Verrio, an Italian who came to England at the wish of Charles II. The many great country houses built in this period reflect the social tendencies of the times. The old English hall where family and servants assembled gave place to stately drawing rooms, and the servants were now housed in separate wings or on the upper floors and participated in none of the family life.



Details of Door from Clifford's Inn, London, Showing Vigorous Character of Mouldings

Detail of Doorway and Paneling from Clifford's Inn, London, Illustrating the Baroque Influence in Broken Pediment and Ornamented Mouldings

The restraint which was characteristic of the architecture is, however, not found in an equal degree in the furniture. Under the royal patronage, artists came from the various European countries, notably France, Portugal and Holland, and brought with them the traditions of design that had developed on the Continent. With the accession of William III many craftsmen came from The Netherlands, either at the direction of the king or of their own accord, in expectation of receiving favor from their compatriot. Despite the Dutch origin of William and the many workmen from Holland, the dominating influence on the furniture of the period is not Dutch, but French. This is not so evident in the detail as in the form; some of the early stools, benches and chairs of the time show very close relationship with the forms developed in France during the reign of Louis XIV, and for the student of furniture provide an interesting example of the international relation of style.

This was particularly the age of walnut; the nature of the designs for furniture was such that a softer wood than the previously popular oak was needed, the intricate turnings that were so often used were not

A Triple Arched William and Mary Chest with Twisted Legs and Typical Stretchers

practical in oak because of its tendency to split, and the cut-out patterns of stretchers also were more easily worked in the softer wood. The wood was, perhaps, more specially valued for its pleasing color and grain, and this developed the extensive use of veneering, which is probably the outstanding characteristic of William and Mary furniture. Thick saw-cut veneer was universally used with a great appreciation of the beauty of the wood's natural grain. Much of the decorative quality of the furniture of this period comes from the manner in which the various veneers were applied. The larger central areas of such parts of furniture as drawer fronts and cupboard doors were veneered with specially chosen wood, displaying the choicest figure, and ranging in tone from black and warm brown to deep golden yellow; bordering the larger panels were often broad margins of veneer "cut on the cross," so that the grain ran transversely; in other cases, particularly drawer fronts, two narrow strips of veneer, selected for very fine grain and similarly "cut on the cross," were placed so that the grain in each was diagonal and the two at opposite angles, thereby giving an effect similar to a feather or herringbone pattern. The mouldings were similarly worked in thick, saw-cut veneer with transverse grain.

Beech was used extensively as a substitute for the more expensive walnut, and other woods had certain popularity, too, such as olive, yew, cedar and sycamore, but walnut was greatly predominant. In many of the pieces various woods were used; walnut was reserved for the important positions where advantage could be taken of its wonderful color and figure, and beech and less expensive woods used for turned legs, finials and drops, which parts were painted black and varnished, thus lending variety and interest to the whole.

The favor with which fine figured wood was looked upon was instrumental in developing a class of workmen who were expert at imitating the grain of walnut in cheaper woods through the use of paint, the whole being finished in varnish.

High Back Arm Chair of William and Mary Period in Hampton Court Palace. Upholstery is Genoa Cut Velvet

The largest and most important piece of furniture developed at this time was the bureau cabinet, an example of which, unfortunately, we are not able to illustrate. The lower portion consisted of a chest of three or more drawers set upon large and squat globular feet, and surmounted by a sloping hinged flap, which when swung out and supported by slides provided space for writing, similar to the writing desk so popular in later Georgian times. This bureau portion was generally very simple in treatment, the skill of the designer and artisan being expended on the upper portion, which was more shallow than the lower and was fitted elaborately for use as a cabinet. It was enclosed by a pair of doors with rounded heads to conform to the arched head, similar to that on the chest shown on page 159, but usually composed of but two curves. The doors stood open like an altar triptych and disclosed an ingeniously arranged interior consisting of concave front drawers at the bottom, and a central cabinet with a door divided from the surrounding space by delicately turned pilasters; often there were small niches containing carved and gilded figurines, the whole constituting a very impressive and decorative piece of wall furniture.

Chests and cabinets of various types were made in great quantities during the period. There was great interest taken in decorative china, following the example set by the queen, and this with the further interest in the wares of the Orient, stimulated by the trading of the Dutch East India Company, was undoubtedly directly responsible for the great demand for cabinets.

The chests of drawers took several forms, one being the chest-on-chest; some of these were most elaborately made with shaped drawer fronts making a series of three or four continuous niches across the face of the chest and extending the full height, culminating in the top drawer in a series of hollowed out domical spaces. The more popular type of William and Mary chest was made up of four or more drawers supported upon a five- or six-legged stand, similar to the examples shown on pages 159 and 160. Their tops were made arched in two or three motives, with the number of legs corresponding, although many had a simple flat top with slight moulding or in some cases a frieze and cornice, the frieze in many cases being arranged as a concealed convex drawer.

The chairs of the period show vigorous qualities of design and likewise the first intended use of upholstery in English seating furniture. Great armchairs that held their place against the dignified chimneypieces of Wren were beautifully made with high backs, "wings" and scroll arms, and upholstered for the most part in *gros* and *petite point* needlework.

Walnut Veneer William and Mary Chest with Marquetry Inlay

Walnut Veneer "High Boy" in William and Mary Style

ARCHITECTURAL & BUILDING ECONOMICS DEPARTMENT

C. STANLEY TAYLOR, *Associate Editor*

The Co-operative Financing of a Group of Homes

THE unusual conditions of building and real estate markets to-day, together with the element of high rentals, are operating to direct interest more than ever into the channels of co-operative financing — an activity almost unknown in this country before the war. This condition is particularly true in the dwelling field, and to a certain extent it has been applied successfully to make possible the construction of apartment houses and some inexpensive residential developments.

Recently an entirely logical but somewhat unusual plan of co-operative financing has been developed in the field of medium cost houses, and as the operation has already been successfully financed with full intention of erecting the houses this spring, it may be of interest to architects in various sections of the country to know how one architect somewhat indirectly brought about the development of an interesting line of work for his office. The casual development of this idea is somewhat interesting, and came about in the following manner:

Not many months ago the architect in question was lunching with a business friend in the downtown section of one of our largest cities. After a time the conversation drifted to the subject of high rentals and to the increasing interest of many apartment dwellers in the possibility of owning attractive residences in suburban sections. The final advice of the architect given in a semi-humorous vein was to the effect that his friend would do well to get together a group of interested associates and build up a small community of attractive and not over-large homes. The subject was dropped here, and the architect gave it no further thought.

About two weeks later, however, he was surprised to receive a telephone call from his friend making an appointment for the purpose of discussing the possibility of developing a small residential community. During the course of the second conversation it developed that the business man had spoken of the matter to a friend of his — a real estate broker — dealing in suburban property, and still in a casual vein had been informed of an attractive piece of acreage containing about ten acres of land located in one of the fine suburban districts near a country club and available for quick sale at a very low figure. Putting the two ideas together the business man made inquiries and found that several of his friends would certainly be interested in owning small homes in a congenial community.

A third meeting, this time with the real estate man present, resulted in the decision to attempt definitely carrying out a co-operative project.

Method of Organization

After analyzing the situation carefully it was determined that if thirty people could be found, each willing to put up $7,000 in cash in order to obtain an attractive home, the duplicate of which could not be purchased in the chosen district under $18,000, the project could be worked out. Through friends and the activity of the real estate man, thirty people were found in about two months' time. Meanwhile an option had been taken on the land in question, and a brief prospectus had been written showing how it was intended to carry out the project. As each person became interested in becoming a partner in the operation, a simple agreement was signed and $1,000 provided in cash, so that at the end of this period $30,000 — the price of the land — was in the bank.

The next step, however, to make it possible to carry out this operation was to obtain a fairly liberal mortgage loan. The architect prepared a water-colored sketch showing the proposed layout of the property, together with perspectives and floor plans of three types of houses to demonstrate the general character of the homes, although no two were to be alike in general appearance. Armed with these drawings and the agreement by thirty responsible persons to carry out the operation, the real estate man took up the matter with several financial institutions, one of which agreed to make the desired mortgage loan. Immediately, then, the property was purchased, all cash being paid as required in the transaction in order to obtain the favorable price.

To-day the property has been purchased and agreement has been made as to the construction and permanent mortgage loan. In following paragraphs the figures will be given, together with the general plan as it is to be worked out.

The plot of land in question contained ten acres, and it was decided that by placing six houses to an acre, five acres would be ample for the thirty houses which are to be constructed. The balance of five acres was taken, having in mind an increment in value incident upon the locating of thirty attractive homes at this point.

The following is a tabulation of the cost of the operation, showing how $7,000 from each of thirty persons has made this development possible:

Land — ten acres at $3,000	$30,000
Improvements — streets, lot grading and utilities, $4,000 per acre	20,000
Cost of houses — thirty at $12,000	360,000
Total cost of development	$410,000
Blanket mortgage from financial institution	200,000
Total net cost of operation to thirty persons or $7,000 from each in cash.	$210,000

The mortgage which was obtained was for $200,000, representing less than 50 per cent of the cost of improved land and houses. This mortgage applied only to the five acres of developed land, together with the houses thereon, and was taken at 5½ per cent, a one-thirtieth part being chargeable against each house as a first mortgage, the individual owner giving bond to this amount. The period of the loan is for five years. The expense of obtaining the loan was met by joint contributions by the principals, amounting to very little for each person — in this case about $100 each.

At a meeting of the thirty principals a committee of five was appointed to supervise in a general way the carrying out of the work, this being done to make more flexible the relations with the architect and contractor.

Advantages of Co-operative Building

In analyzing this plan it is evident that the advantages to be gained are somewhat numerous and not all financial. From a financial viewpoint there is, of course, a certain economy in building a comparatively large group of houses, as the purchase of material and necessary service for such a group shows an appreciable saving per house over the cost of building a single home. A second financial point is the certainty that the five acres of land which is not built upon will be increased materially in value when this nucleus of an attractive community is complete. To give each of the principals the advantage of this condition, the five acres were divided into thirty lots, after streets had been mapped out, and one lot given to each of the thirty principals. So that there would be no question as to the selection of lots, each was numbered and each principal drew a numbered slip from a closed box, showing which lot he was to receive.

From the viewpoint of each of the principals in this transaction, in addition to the evident financial benefit of taking advantage of group buying, together with the ownership at lot cost of an attractive residential plot which will rapidly enhance in value and will be readily salable, there are the numerous advantages of having an attractive home built to suit the tenant: each man knows who his neighbor will be, and the character of the development is standardized from the outset. It has already been proposed to form what will be known as the community club, having as its purpose not only direct assessments for the upkeep of streets, lawns and similar work, but also considering the possibility of building tennis courts and similar community facilities. There is also available the country club, so that an almost ideal condition has been created and one which has a tendency to offset considerably the high cost of rentals or purchasing under present conditions.

An agreement has been made through which no principal will sell a house for a period of five years until it has been offered to the community club at cost price for redisposal, and in this manner any tendency toward immediate speculative profit on the houses has been eliminated and the character of occupancy guaranteed for the first five years, after which the standard of the community will undoubtedly direct its growth properly.

This is an interesting incident of the legitimate development of work on the part of an architect in the course of which all parties to the transaction receive direct benefit. There is no question but what this plan can be carried out in practically any residential community to-day. The minimum number of houses which should be built is ten, as it is estimated that at this point in the construction of houses costing approximately $12,000, a noticeable factor of economy in material purchase and construction cost can be realized.

It would seem from all indications that rentals are to go still higher in the fall of 1920, and with the great dissatisfaction which is being shown for this condition, together with the fact that many persons are in a position now to invest money in a home, it is evident that thousands of homes in this class will be individually built or purchased during the next two years.

There are numerous advantages in the co-operative method of home development which have not been outlined in the foregoing article, but which will be evident upon consideration of the question as it will have local application. By following the steps which are taken by the various interested persons as described in this article, arrangements can be made to carry out such a project more easily than would at first seem possible.

Usually in considering a group of twenty-five or thirty residences purchased individually, there is a speculative profit to be considered which will probably be 15 or 20 per cent of the cost of land and building. Thus by grouping together in a co-operative venture there is a considerable saving over individual purchase, and a definite saving over individual building.

The Situation Regarding Building Loan Money

IN several cities where during the last year money for building construction and permanent mortgage loans has been available in considerable quantity on conservative appraisals, there seems within the past month to have been a reduction. There are not so many advertisements in the papers offering money for mortgage loans, particularly for building money; and from Middle Western cities statements have been received from builders to the effect that they cannot carry out expected operations because of the apparent shortage in the building loan market.

In order to get the bankers' viewpoint on this subject, we asked an official of one of the important national banks of the Middle West what might be the reason for this condition, and whether or not it was caused by lessening confidence in the building field. We were interested and somewhat relieved to learn that any curtailment of building loan and mortgage funds is not due, at least on the part of financial institutions, to lack of confidence in buildings as security, but to the fact that "there are greener fields elsewhere."

Large sums of money which normally might be available for construction and permanent mortgage loans are being directed into the richer and more active fields of commercial credit. Business expansion in large and small units is being carried out in a manner probably never before known, and usually these ambitious programs (which incidentally often entail business construction) must be financed through the assistance of banks. Commercial paper is being presented for discount in considerable quantity, and short term loans of the various classes are greatly in demand.

We must digress for a moment to explain briefly that the Federal Reserve Bank is essentially a bank which loans to banks, taking as security the security which the bank in turn has taken in making its loan, but charging a lower percentage than the bank charges its customers. Hence one of the legitimate and sound channels of profit in banking.

Short term loans of various types are accepted by Federal Reserve Banks as security, whereas real estate loans are not considered in this class. Therefore, to a great extent, the activity of banks to-day does not include real estate financing to any greater extent than is necessary. We have, therefore, to depend largely upon individuals, estates and corporations other than financial, for real estate mortgage funds which are in the nature of an investment rather than a banking proposition.

It is evident, therefore, that the soundness of building collateral is not questioned beyond the normal conservatism regarding loaning against increased cost of construction. On the other hand, from a casual analysis, it would seem quite possible that the financing of commercial expansion will soon reach a point where it is not deemed safe to continue farther; and in that case considerable money will probably be redirected into the channels of financing building construction. In the northeastern section of the United States there is evidence that bankers are shutting down somewhat on commercial short time credit, particularly where it is directed toward individual business expansion. Therefore, it is logical to expect developments in the building loan field toward the end of this year.

There is little doubt that many of the ambitious building plans now on the architects' boards must be abandoned through lack of basic financing, and, unfortunately, but apparently, through lack of building material or too excessive cost. The abandonment of a number of large projects, rumors or knowledge of which have had a tendency to inflate the market for materials, will be beneficial to the general building trade and to architects in general in that it will release materials of various classes, which in turn will make possible the completion of many of the smaller operations.

The return of the railroads to their respective owners brings with it a promise to favor the transportation of building materials which at present are far down on the preferred list. This transportation question is one of the chief causes of the difficulty in getting building materials, and unfortunately affects the financing of building operations, as it makes uncertain even the most careful cost estimates. A direct example showing a reflection of this condition may be quoted.

Careful estimates as to the cost of a building — all bulk materials being covered by dependable quotations and in some cases by written agreement — were made and delivered to a financial institution which was seriously considering making a building and permanent loan to meet the requirements. Two of the dealers who had agreed to furnish certain necessary materials in large quantity stated that it would be impossible for them to fulfil contracts, as material was no longer available. Upon further investigation it was found in one case, at least, that the material which had actually been in storage at the time had been sold to take advantage of an increased price, and the dealer was not at all anxious to carry out the contract. This unsettled condition resulted in a refusal of the financial institution to consider financing until prices were better stabilized, and here at least is one job which must be given up until more favorable conditions are developed.

A National Bank Sets a Precedent in Financing New Housing

A FEW months ago we seemed to have reached a point of saturation in considering the industrial housing problem. The press was flooded with theoretical and practical articles on the subject. Many solutions were offered, some of them practical. Miracles in the production of low-cost houses for industrial employees were attempted and failed. It was found by practical experience that with labor and material costs as they are to-day, the minimum sized, five-room frame house with cellar costs approximately $4,000, regardless of plan.

The industrial housing problem is with us to-day, however, greater in volume than ever before, owing not only to industrial expansion requiring additional housing for the animate machinery of industry as well as the inanimate, but to the fact that home building has not kept up even with normal demand; while to-day the demand for homes among the middle class may be fairly termed abnormal.

The standard of the average home demand has been considerably raised by conditions of better living. The rapid increase in the cost of building materials and labor has greatly disturbed the past balance between finance and building.

We find, therefore, a condition where new channels for the obtaining of building and permanent mortgage loans are being eagerly sought, and many theoretical solutions of this problem have been advanced. These include not only financing by the Government in a manner similar to the Farm Loan Banks, but the organization of mortgage companies selling bonds to the general public. The theory has also been advanced that the saving methods induced by Liberty Loans should be considered as a vast money producing machine, the power of which could be turned to the provision of homes through Government or possibly through private initiative. In the form of partial equity financing this has been done rather successfully in the Middle West, where many mortgage companies have been formed, selling bonds to raise capital, and directing this money into the form of second mortgages or land contract purchases, which have made a flexible financial condition and greatly assisted in providing homes.

It has apparently remained, however, for the

The "Holyoke National Way" of Solving the Housing Problem

This bank will make a construction loan to any approved builder, for any family in Holyoke, South Hadley Falls, Chicopee, Chicopee Falls or Willimansett, who have One Thousand (1,000) Dollars on deposit in its Savings Department, for the six months preceding the decision to build.

The lot must not be less in size than 50 x 120 or 60 x 100 (this will give plenty of room for a garden). The house and land to cost not less than Five Thousand (5,000) Dollars, with all necessary modern improvements.

If a two-family house is desired, a deposit of Two Thousand (2,000) Dollars, or thereabouts, must have been on deposit for the same period, and the house and land to cost not less than $8,000.

The money on deposit with us is to be used to purchase the lot or start the house, or both. The location must be subject to our approval, and all houses connected to sewers.

All applicants must be American citizens, or at least have their first papers to become such.

For this purpose we will use

ONE HALF MILLION DOLLARS

After the house is completed and approved, we will make an effort to get you a Savings Bank loan for 50% of the *actual cost* of house and lot. The difference between the Savings Bank loan and the cost of the property, *less amount of your own money used*, we will carry for you at 6% interest, payments to be made weekly, or monthly, as may be arranged.

EXAMPLE:

WHILE BUILDING:—

To buy lot and start house. . . .	$1,000 of your money
To complete house.	4,000 of our money
Total cost of property. . .	$5,000

WHEN COMPLETED, LOAN WILL STAND:—

Savings Bank loan 50% of cost.	$2,500
Your money to start house.	1,000
What you will owe us to be paid in weekly or monthly payments.	1,500
	$5,000

It is not usual for a National Bank to make loans of this kind (though permissible) but this Bank was formed forty-eight years ago, to be of benefit and convenience to the citizens and business interests of this vicinity, and in the present crisis, we feel that we would not be doing our duty as a bank, if we did not come forward in this time of extreme emergency, and we do not know of any better way to be of service and help to this community, than to use the money, (about 6% of our deposits) that was *saved here*, *belongs here*, and *should be invested here*, for the benefit and happiness of those who saved it.

The money which will be used for this purpose is *yours*, and held by us as your *Trustee*, to be invested wisely for your account, and we know of no better investment of those funds, than in a home of your own, for the benefit and comfort of yourself and family.

The *one half million dollars* which we will loan, together with the 20 to 25% of your own savings, and the 50% loan from the Savings Bank should help the community to the extent of

ONE AND ONE-QUARTER MILLION DOLLARS
as follows:—

Investment of your money.	$ 250,000.00
Investment of Holyoke National.	500,000.00
Total from this Bank.	$ 750,000.00
Savings Banks Loans.	500,000.00
Total.	$1,250,000.00

HOLYOKE NATIONAL BANK
HOLYOKE, MASS.
by its Directors
Dwight H. Ives James H. Wakelin
Howard F. Metcalf Azro A. Coburn
Geo. C. Gill

Holyoke National Bank of Holyoke, Mass., to set a precedent in directing additional funds into the channel of greatly needed homes. We term this a precedent, as to our knowledge this method of financing is quite new and unusual for national banks.

The general plan by which this bank has made available a first appropriation of $500,000, which will result in the construction of one and one-quarter million dollars' worth of homes, is given in the attached reproduction of a descriptive sheet issued by the bank. It will be noted that this plan is available for clients of the savings department of the bank. Apparently the fact that a savings account has been carried is considered a good guarantee of character. The bank undertakes to obtain a first mortgage loan from other local financial institutions and to make it possible for a client to own a house if he has 20 per cent of the cost of land and house available for investment in this manner. The balance of necessary money is repaid to the bank in weekly or monthly payments, thus making it comparatively easy to own a new house.

This plan undoubtedly meets squarely the situation which has held back the construction of homes. Mortgage money has been fairly easy to obtain for 50 per cent of the cost of building a home; but it has usually been found that the prospective home owner has only about one-half the necessary equity and is unwilling to pay the exorbitant demands for second mortgage money made by private individuals, sometimes reaching as high as 20 per cent of the total cost.

We see no reason why financing cannot be provided in many sections of the country in this manner, and the experiment of the Holyoke National Bank will be watched with great interest to see what definite results are forthcoming in the way of new houses in the bank's community.

Estimating the Selling Price of a Suburban Residence

A NEW YORK architect was recently called upon to render a somewhat unusual service for a client for whom he had designed a large suburban residence which was constructed in 1913. The client stated that for the needs of his present family the house was too large and felt that now was an advisable time to sell and build a smaller house for himself. He was somewhat at a loss, however, to determine what selling price to put on the house, as he did not wish to place it in the hands of a real estate agent until he had set a definite sales price.

In considering the sale of the average building, whether an investment building or a small home, market conditions largely govern sales value; but in the case of a suburban residence the sale price is largely governed by a personal element represented by the buyer's opinion, and in to-day's market it is apparent that as a rule two large suburban houses containing approximately the same cubic footage and with apparently equal land value will vary over 20 per cent in selling price. This is undoubtedly due to individual demand and to general conditions of the community. It is evident, therefore, that the owner's decision rather than market value must largely govern the price.

The method used by the architect in determining a fair selling price for this house is interesting and may prove of value to others who must face the same problem from time to time, or who through sound business judgment may encourage the sale of houses built some years ago for clients. In this case the selling price was estimated as follows:

To the cost of the land was added the cost of improvements. The complete cost of the house and out-buildings was then computed from the architect's files, and to this total was added one-half of the increase in replacement value of the house. It was felt that this addition represented a saving to the buyer in proportion to the cost of building a new house, and also provided for any depreciation in the building. To the total thus gained a reducible margin of 10 per cent was added, as in the average case of the sale of a house of this type the quoted selling price is not fixed, but is open to offer on the part of the buyer. The tabulation of this individual cost estimate is as follows:

Cost of land (thirty acres)	$12,000
Improvements, including roads, landscape, planting, etc.	14,000
Cost of house and out-buildings	90,000
One-half increase in replacement value (estimating 100 per cent increase in building cost)	45,000
	$161,000
10 per cent reducible margin	16,100
Selling price of house	$177,100

The determination on a definite selling price places the broker in a much better position to make a sale than a general commission to get an offer, which is quite an ordinary proceeding on the part of an owner of this class of property. The estate in question was not mortgaged, and the owner stated his willingness to leave a mortgage of $100,000 at 5 per cent if this proved an inducement to the purchaser. In this manner there was presented a clean-cut selling proposition fair to all parties to the transaction.

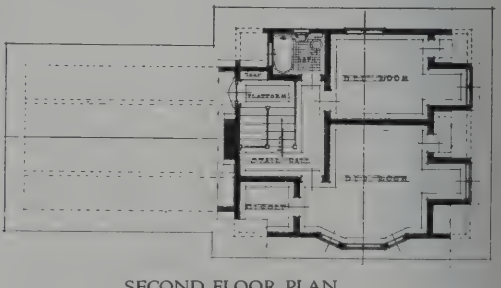
A Small House at Paducah, Kentucky

W. E. GORE, ARCHITECT AND OWNER

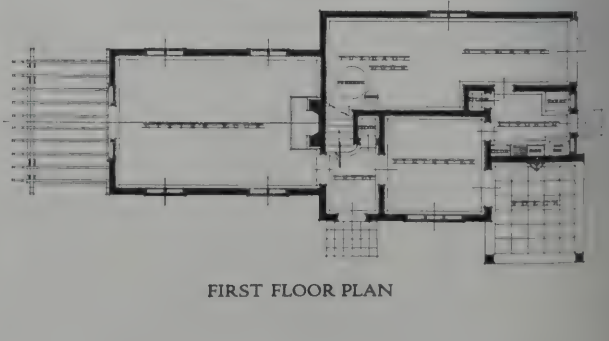
GENERAL VIEW OF MAIN FRONT

DETAIL OF ENTRANCE GABLE

THIS English type country house is unique in combining in one building, without a cellar, a two-story living room, a garage and a furnace room in addition to the usual rooms. The kitchen forms a link between the living quarters and the garage and furnace room, this latter space being at grade level. The rooms are well arranged for ventilation, the living room being especially well equipped to make warm weather endurable. The bedrooms, likewise, have good cross ventilation, and the stairway, opening as it does from the upper part of the living room, provides passage of air through the length of the house.



SECOND FLOOR PLAN



FIRST FLOOR PLAN

An Influence for Better Small House Design

A COMMERCIAL ENTERPRISE IN WHICH THE VALUE OF ARCHITECTURAL DESIGN IS GIVEN FULL RECOGNITION

By FREDERICK L. ACKERMAN

DURING the last ten or fifteen years the subject of small house design has been a live topic of discussion among architects and at the Conventions of the Institute. Particularly has it been a live topic among members of the chapters of the Middle West. We have had our committees on Public Information attempting to spread propaganda relating to the better design of small houses, and some of the local chapters have gone to a great deal of expense and labor to encourage the building of better homes for the people. Competitions have been held and organizations effected for the distribution of plans to those interested in building small houses. This effort has not alone been confined to the profession. State agricultural colleges, State Departments of Agriculture and the Federal Department of Agriculture have likewise devoted a considerable amount of effort, not only to the stimulation of a better understanding of what constitutes the adequate, well designed, small house, but those several agencies have prepared plans for distribution to those living in our rural areas who wish to take advantage of the study given to this problem by the agencies above referred to. Nor is this attitude on the part of the profession and on the part of certain agencies of Government confined to the United States. Far more serious consideration has been given to this problem in Europe, and as result of years of experience with the problem the British Government has recently issued a volume of considerable scope and detail, the purpose of which is to furnish information as to how best to build a small house.

If one may judge by the amount of space devoted to this subject in the British press, it is safe to say that the problem of providing the average man with an adequate house in an adequate environment is deemed to be a matter of no less than prime importance to the national welfare.

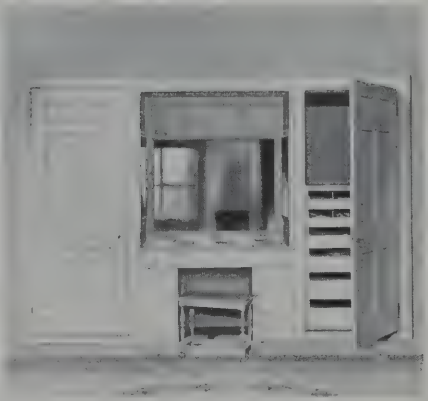
If we take into account all of these activities directed toward the provision of more adequate and better designed houses, it should be evident that there is a recognized difficulty in their production. That is to say, by these activities we acknowledge flatly that our system of production as it has been running, and our professional activities as they have been carried on individually and collectively, have failed in this rather important respect; neither our system of production nor our professional activity has thus far been able to provide the common man with a well designed house. Precisely why these two agencies have failed, of course, would be an interesting point to discuss; but a discussion of this point is not the purpose of this article, which is rather that of setting forth what has been attempted by utilizing the present business and professional mechanism as it exists.

Any architect who has ever attempted to select from the average catalogue of stock wood products, items which he might utilize and thereby save the

The English Cottage Type

The " Southern " Bungalow Type

Typical Standard House Designs That Use Standard Wood Finish



Standard Built-in Dressing Table

expense of special forms, mouldings, etc., is so well aware of the utter lack of merit, from the standpoint of design in the materials shown in the average stock list and catalogue of woodwork, that no argument is needed to convince him of the desirability of having a stock list of simple elements of such a quality of design that he could actually use them in his practice. It was really out of their own recognition of the shortcomings of these various old stock lists of mouldings, sash, doors and trim previously furnished, that The Curtis Companies undertook the work of reorganizing all of their stock forms and lists.

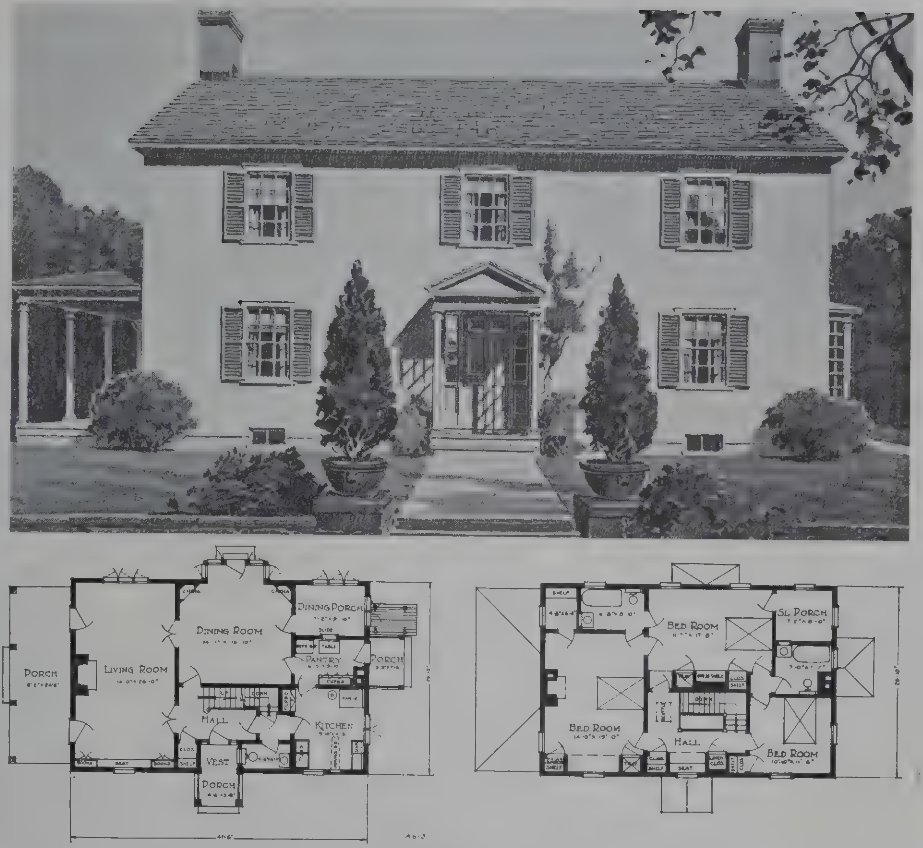
But the reorganization of this stock list was no simple task. The architect into whose hand it was entrusted, recognized at the outset that there is no such thing as a standard of taste, and that every phase of the problem would have to be dealt with from the standpoint of averages; that is to say, it would be impossible to stock a line of materials which would meet the demands arising out of the idiosyncrasies of taste of the individuals constituting the entire profession, as well as a lack of taste on the part of many buyers. It was for this reason that a study was made of those forms which had been most frequently used by architects of recognized standing and ability. Whatever could be adopted from architecture of an earlier period or from the work of contemporaneous architects, has been made use of without hesitation. And acknowledgment is made to those of the profession who generously responded to the request for suggestions and details which experience had tested. In the design of all these elements the attempt has been made to supply what appeared to be a felt want. Certain concessions naturally had to be made to meet the requirements of quantity production under the machine process, but it was interesting to discover that so long as the selection was confined largely to simple forms, in this respect no serious difficulty was encountered.

Having developed in the rough the new designs for the stock list, the problem naturally arose as to where these forms could be used, for it became apparent that the earlier designs of houses, upon which the old details had been used, were not of such a character as to readily admit of the use of

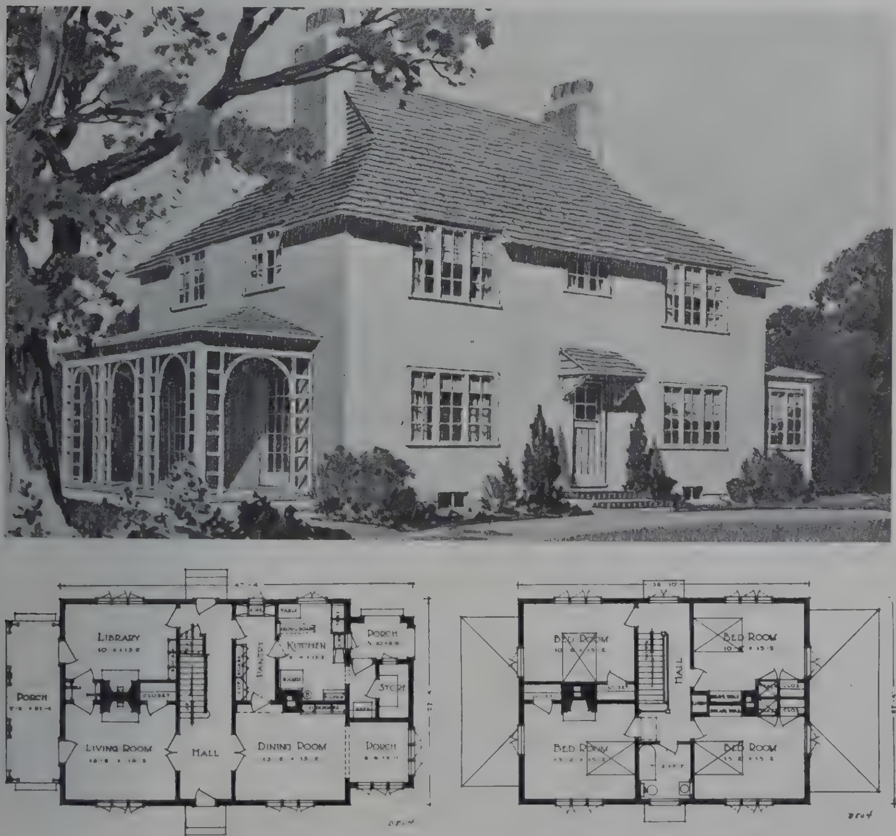
Standard Designs for Colonial Entrances To Be Carried in Stock
Trowbridge & Ackerman, Architects

the new forms, and hence it was necessary to develop a complete list of new house designs to take the place of the old.

These new houses range from three to eight rooms as regards size. They are more or less equally divided as regards those appropriately designed for use upon wide and narrow lots. Generally speaking, what is spoken of as a "standard plan" is used as a basis for one or more Colonial expressions, one or more based upon British tradition, one or more of a so-called "Western" character, and among these houses of bungalow type there is always one design characterized as Southern.



A Standardized Colonial House for Standard Wood Finish
(Note Incorporation of Dressing Table Shown on Opposite Page)



A Standardized English Type House for Standard Wood Finish
Trowbridge & Ackerman, Architects

In designing the house, the same underlying thought which was kept in mind in developing the details was carried out; material and inspiration were drawn from every available source, and there was likewise an attempt to meet an average "common sense" standard of taste rather than to furnish designs which would meet the demands of those who desire something odd or peculiar. The accompanying illustrations, together with their titles, will serve to explain in more detail what has already been suggested in outline.

A study was made of what the various agricultural colleges and the State and Federal Departments of Agriculture had been doing in connection with the planning of farmhouses. The designs which were developed for this type of structure represent the concensus of opinion of those

who are supposed to know what constitutes an adequate farmhouse.

In the development of some two hundred houses one would naturally assume that a great variety of forms and details would be needed. In practice the opposite to this was discovered to be true. As a matter of fact, the new stock list extends the range of commodities to be obtained far beyond our actual needs, both as regards size and variety. This list was extended to meet a demand which had undoubtedly grown out of a long period of competitive effort. As a result of this experience I am convinced that a very small list of well designed stock forms would serve the architectural needs in the building of small houses in the United States, and a small list would save an endless amount of waste and confusion.


Typical Interior Staircase

In this statement I am not dealing here with the question of whether or not "standardization" is fatal to the development of the creative impulse of individuals. I am rather merely taking for granted that quantity production by the machine process is an institution with which we must deal for the time being, and that our problem in effecting a more adequate material environment under the régime of the machine process is that of bringing the machine under control of the man. We may argue against the machine process as something which contaminates the effort of the workmen; and undoubtedly it is true that the machine process affects and tends to inhibit the creative impulse; but I incline to the idea that the time is not yet ripe for us to debate this phase of the question seriously.

For I believe thoroughly that, if the machine process could be lifted out of the control of predatory forces, or if we could bring our social and economic institutions and industrial processes into an harmonious working, we could create out of the machine process a material environment which would be superior, from the social standpoint, to anything thus far created by the architects and builders of the past. It might be that an art thus evolved would be rather more rigid. It might be that it would not conform to our criterions of taste which have grown out of our handicraft industry. If it did not then satisfy us, we could debate the question of what to do with the machine. For the present the problem appears to be that of discovering how to make man the master of the machine.


Standard Designs for Stock China Closets in English and Colonial Styles
Trowbridge & Ackerman, Architects

DEPARTMENT OF ENGINEERING & CONSTRUCTION

CHARLES A. WHITTEMORE, *Associate Editor*

The Automobile and the Private Estate

PART II. DIMENSIONS OF AUTOMOBILES

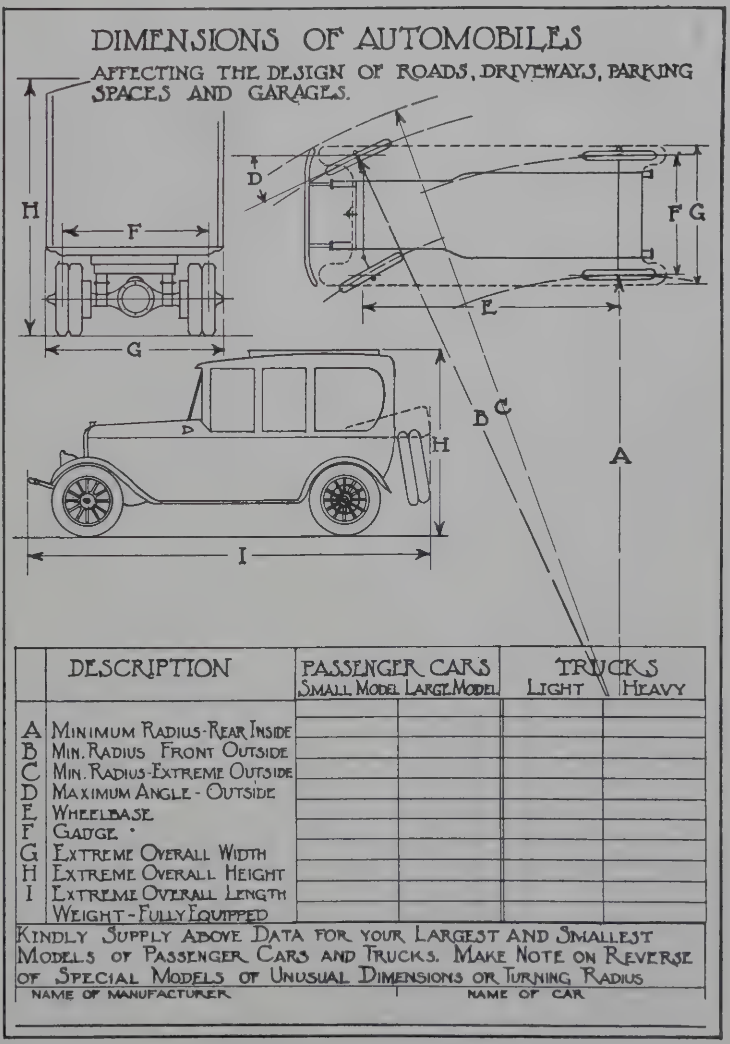
By TYLER STEWART ROGERS

A STUDY of the characteristics of automobiles shows that they have certain physical requirements which have a distinct effect on the design of estate units. A theoretical study of these characteristics is of little value without the facts showing the consequent requirements in detail. There has been surprisingly little written about the automobile from the point of view of its physical dimensions and its turning radius, hence inquiry into this field led to the preparation of a questionnaire designed to procure data covering all the dimensions of motor vehicles which affect the design of roads, driveways, parking spaces and garages. A diagram similar to Fig. 1 was sent to a list of automobile engineers representing approximately 172 manufacturers. At the time of this writing, answers have been received from about 46 manufacturers, giving data about 42 models of passenger cars and 37 trucks. Although incompletely covering the field of motor vehicles, the cars represented are sufficiently varied in their size and characteristics to indicate quite clearly the tendencies in motor car design. Certain figures do not seem to be correct in relation to the other dimensions obtained, hence in the accompanying tabulation showing the results of this investigation in detail there may be errors. This data, however, so far as known,, is the first compilation of its kind, and therefore may prove of some value as a general guide to architects, landscape architects and engineers engaged in estate design.

Both passenger cars and trucks have been studied, inasmuch as they each have an effect on the dimensions of estate units. It would be folly to design an entrance gateway beautifully ornamented with iron work through which a van carrying the furniture to the new estate could not pass. It would be equally bad to design a graceful bridge strong enough for passenger cars but not able to stand the passage of a tank truck bringing fuel oil to the residence. Similarly, the location of overhead wires and the height of overhead bridges should be governed by the dimensions of the largest size motor vehicle that might even occasionally wish to enter the property.

The study of the dimensions of passenger cars has its primary value in determining the design of turn-arounds, parking spaces, etc., Fig. 2.

A study of the extreme turning radius of passenger automobiles is given in Table 2. By extreme turning radius is meant the radius of the circle de-



DIMENSIONS OF AUTOMOBILES
AFFECTING THE DESIGN OF ROADS, DRIVEWAYS, PARKING SPACES AND GARAGES.

	DESCRIPTION	PASSENGER CARS		TRUCKS	
		SMALL MODEL	LARGE MODEL	LIGHT	HEAVY
A	MINIMUM RADIUS-REAR INSIDE				
B	MIN. RADIUS FRONT OUTSIDE				
C	MIN. RADIUS-EXTREME OUTSIDE				
D	MAXIMUM ANGLE - OUTSIDE				
E	WHEELBASE				
F	GAUGE				
G	EXTREME OVERALL WIDTH				
H	EXTREME OVERALL HEIGHT				
I	EXTREME OVERALL LENGTH				
	WEIGHT - FULLY EQUIPPED				

KINDLY SUPPLY ABOVE DATA FOR YOUR LARGEST AND SMALLEST MODELS OF PASSENGER CARS AND TRUCKS. MAKE NOTE ON REVERSE OF SPECIAL MODELS OF UNUSUAL DIMENSIONS OR TURNING RADIUS

NAME OF MANUFACTURER

NAME OF CAR

Fig. 1. Questionnaire Used to Obtain Data

scribed by the most forward projection of the car, such as the front fender or bumper, when the car is turning the sharpest possible circle. Where no figure is given for the extreme radius, the radius of the front outside wheel is used. This diagram indicates that the variation is from 15 ft. to nearly 30 ft. Only four cars, however, have a radius under 19 ft. 6 in., and only four cars exceed 25 ft., hence the space requirements for turning most cars varies so slightly as to make it well worth while to accommodate the largest vehicle when making provision for any turn-arounds. It will thus be seen that a 60-ft. circle should be the smallest area provided for the turning of passenger cars without backing. It has been shown, however, that this minimum turning radius can only be approached in actual driving under very favorable conditions, hence the common practice of an 80-ft. or an 85-ft. turning space is none too small.

The gauge of passenger automobiles is shown to be uniformly 4 ft. 8 in., with the exception of one discontinued model having a tread of 4 ft. 9 in. and one having a tread of 4 ft. 8½ in.

The length of passenger cars is shown in Table 3. Dimensions vary from slightly over 11 ft. to 18 ft. 4 in. The questionnaire called for the extreme dimension, including bumpers, tenders, tire racks and other projections beyond the normal body lengths. Not all cars are equipped with these appliances, and therefore the figures in many instances only cover the extremes from the front springs to the rear fenders or top.

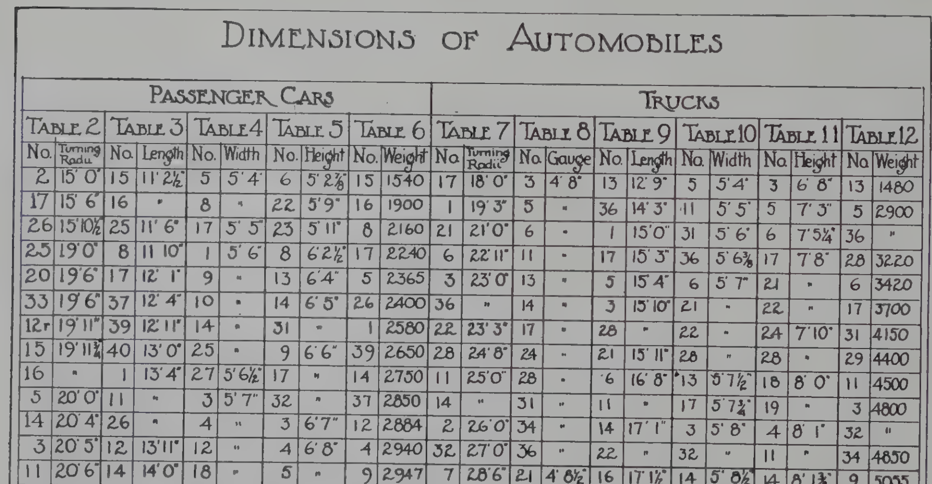
The width of automobiles is remarkably uniform, varying from 5 ft. 4 in. to 6 ft. 4 in. The latter dimension was reported by only one manufacturer and probably is for an export model or else is an error. Forty out of forty-one cars show a variation in extreme width of between 5 ft. 4 in. and 5 ft. 10 in. as shown in Table 4.

These last two dimensions, length and width, govern the design of parking spaces for automobiles whether outdoors or within garages. The uniformity of width simplifies the problem very much; and while the length of automobiles varies considerably, the extremes are not so great as to add material difficulties.

Table 5 is an analysis of the extreme height of automobiles. The variation in this case is from 5 ft. 2⅞ in. to 7 ft. 8¼ in.

The weight of passenger vehicles has little effect on the design of any unit of an estate, with the possible exception of the strength of floors for garages. Table 6 indicates that the extremes run between 1,540 and 5,103 pounds, with a comparatively uniform distribution between these weights.

A feature mentioned in Part I of this discussion, namely, the in-



Dimensions of Automobiles

Passenger Cars										Trucks											
Table 2		Table 3		Table 4		Table 5		Table 6		Table 7		Table 8		Table 9		Table 10		Table 11		Table 12	
No.	Turning Radii	No.	Length	No.	Width	No.	Height	No.	Weight	No.	Turning Radii	No.	Gauge	No.	Length	No.	Width	No.	Height	No.	Weight
2	15' 0"	15	11' 2½"	5	5' 4"	6	5' 2⅞"	15	1540	17	18' 0"	3	4' 8"	13	12' 9"	5	5' 4"	3	6' 8"	13	1480
17	15' 6"	16	"	8	"	22	5' 9"	16	1900	1	19' 3"	5	"	36	14' 3"	11	5' 5"	5	7' 3"	5	2900
26	15' 10½	25	11' 6"	17	5' 5"	23	5' 11"	8	2160	21	21' 0"	6	"	1	15' 0"	31	5' 6"	6	7' 5¼"	36	"
25	19' 0"	8	11' 10"	1	5' 6"	8	6' 2½"	17	2240	6	22' 11"	11	"	17	15' 3"	36	5' 6⅜	17	7' 8"	28	3220
20	19' 6"	17	12' 1"	9	"	13	6' 4"	5	2365	3	23' 0"	13	"	5	15' 4"	6	5' 7"	21	"	6	3420
33	19' 6"	37	12' 4"	10	"	14	6' 5"	26	2400	36	"	14	"	3	15' 10"	21	"	22	"	17	3700
12r	19' 11"	39	12' 11"	14	"	31	"	1	2580	22	23' 3"	17	"	28	"	22	"	24	7' 10"	31	4150
15	19' 11¾	40	13' 0"	25	"	9	6' 6"	39	2650	28	24' 8"	24	"	21	15' 11"	28	"	28	"	29	4400
16	"	1	13' 4"	27	5' 6½"	17	"	14	2750	11	25' 0"	28	"	6	16' 8"	13	5' 7½"	18	8' 0"	11	4500
5	20' 0"	11	"	3	5' 7"	32	"	37	2850	14	"	31	"	11	"	17	5' 7¾"	19	"	3	4800
14	20' 4"	26	"	4	"	3	6' 7"	12	2884	2	26' 0"	34	"	14	17' 1"	3	5' 8"	4	8' 1"	32	"
3	20' 5"	12	13' 11"	12	"	4	6' 8"	4	2940	32	27' 0"	36	"	22	"	32	"	11	"	34	4850
11	20' 6"	14	14' 0"	18	"	5	"	9	2947	7	28' 6"	21	4' 8½"	16	17' 1½"	14	5' 8½	14	8' 1⅜"	9	5055
27	"	20	"	38	"	20	"	25	2950	16	29' 0"	22	"	32	17' 8"	1	5' 9½"	9	8' 2"	21	6300
31	20' 9"	5	"	39	"	28	"	40	2980	18	"	1	4' 10"	31	17' 9⅜"	16	5' 9⅝"	31	8' 4"	10	6750
8	20' 10"	31	14' 1"	40	"	38	"	2	3000	4	29' 10"	19	"	24	18' 0"	7	5' 10¾"	32	"	14	7400
6	21' 0"	38	"	15	5' 7½"	39	"	38	"	9	30' 0"	29	"	7	18' 2"	24	5' 11"	25	8' 5¼"	37	7925
4	21' 5"	2	14' 2"	16	"	24	6' 8½"	27	3100	10	"	32	"	9	18' 8½	34	"	20	8' 6⅜"	19	8000
19	21' 8"	19	"	31	"	15	6' 9"	31	3140	34	30' 3½	9	4' 10½"	19	20' 2"	19	6' 0"	12	8' 7½"	18	8200
9	21' 10½	9	14' 3"	33	"	16	"	20	3240	37	30' 6"	25	5' 0"	8	20' 5"	4	6' 1 7/16"	26	"	24	8600
12L	21' 11"	4	14' 4"	6	5' 8"	26	"	24	3430	8	31' 0"	4	5' 0 5/16"	26	20' 8"	37	6' 2¾"	27	"	7	9000
18	22' 3	24	14' 6"	7	"	41	"	19	3500	31	31' 11"	7	5' 1¼"	18	20' 8¼	9	6' 4"	10	8' 8"	22	9360
29	22' 6"	18	14' 8"	11	"	19	6' 10"	22	3600	35	32' 3½	18	5' 4½"	25	21' 0"	18	6' 7⅞"	33	"	35	9400
10	22' 9"	27	"	19	"	25	"	10	3690	33	34' 0"	2	5' 5"	4	21' 8"	26	6' 10"	1	9' 8"	12	9900
24	"	22	14' 10"	24	"	27	"	32	"	12	35' 0"	8	"	37	21' 8⅜"	27	"	2	"	33	11000
32	23' 0"	32	15' 1½"	32	"	37	"	6	3865	23	36' 0"	37	"	15	21' 9"	2	7' 0"	23	12' 0"	1	"
34	"	6	15' 3"	41	"	40	"	28	3900	24	38' 0"	10	5' 6"	20	21' 11½"	8	7' 2½"			30	11600
41	"	28	15' 4"	42	"	7	6' 11¾"	11	4000	25	42' 0"	35	5' 6¾"	10	22' 10¼	15	-			26	12500
38	23' 1"	41	15' 5 5/16	29	5' 8⅛	10	7' 0"	13	"	27	56' 0"	30	5' 9½"	2	23' 0"	25	"			25	15000
30	23' 6"	29	15' 9"	30	"	18	"	23	4120			12	5' 10½"	12	23' 4"	10	7' 3½"			15	16150
13	24' 0"	7	15' 10"	22	5' 8 3/16"	21	"	18	4150			20	6' 0"	33	25' 4"	23	7' 4⅜"			4	16300
22	"	10	15' 11¾	23	"	33	7' 0½"	33	4225			33	6' 1½"	23	26' 4½	20	7' 5⅝"			2	18000
1	24' 5"	3	16' 0"	20	5' 8¼"	30	7' 0¾"	41	4300					27	26' 8"	12	7' 6½			8	20390
42	24' 6"	33	16' 2"	2	5' 9"	11	7' 1"	34	4370							33	7' 8"				
40	24' 10"	42	16' 2 5/16	26	"	2	7' 2"	7	4425												
7	25' 0"	30	16' 5"	35	"	42	"	42	4700												
39	25' 8½	13	16' 8"	28	5' 9½"	12	7' 4"	35	5103												
35	26' 6"	35	17' 6"	13	5' 10"	35	7' 8"	21	5600												
21	28' 0	36	18' 0"	21	6' 0"	36	"														
36	29' 6"	21	18' 4"	37	6' 4"	1	7' 8¼														

Analysis of Returns on Questionaire
See Table 1 for Names of Automobiles

March 1920

T. S. Rogers

Fig. 2. Tables of Dimensions in Classified Sequence

PASSENGER CARS

No.	NAME	Radii				Angle	Wheel-base	Gauge	Length	Width	Height	Weight	Remarks
		Rear In	Front Out	Difference	Extreme								
	Reference Fig. 1	A	B	C-A	C	D	E	F	I	G	H	—	
1	Allen 43	16' 10½	23' 5"	6' 6½"	24' 5"	23°30	9' 1½"	4' 8"	13' 4"	5' 6"	7' 8¼"	2580	
2	Anderson		13' 6"		15' 0"	50°	10' 0"	"	14' 2"	5' 9"	7' 2"	3000	
3	Apperson 8-20	11' 0"	19' 6"	8' 6"	20' 5"	45°	10' 10"	"	16' 0"	5' 7"	6' 7"		
4	Auburn	14' 8"	20' 6"	5' 10"	21' 5"	36°	10' 0"	"	14' 4"	5' 7"	6' 8"	2940	
5	Briscoe		20' 0"			36°	9' 1"	"	14' 0"	5' 4"	"	2365	
6	Cadillac-Roadster	11' 6"			21' 0"		10' 5"	"	15' 3"	5' 8"	5' 2⅞"	3865	
7	" Limousine	16' 0"			25' 0"		11' 0"	"	15' 10"	"	6' 11¾"	4425	
8	Chevrolet 490 Sedan		20' 0"		20' 10"	30°35'	8' 6"	"	11' 10"	5' 4"	6' 2½"	2160	
9	" F.B. Sedan		21' 0"		21' 10½	33° r 32° l	9' 2"	"	14' 3"	5' 6"	6' 6"	2947	r = right l = left
10	Cole Aero-Eight 870	19' 0"	22' 3"	3' 3"*	22' 9"	31°	10' 7"	"	15' 11¾	5' 6"	7' 2"	3690	*does not check
11	Detroit Electric	12' 4"	19' 0"	6' 8"	20' 6"	26°	8' 4"		13' 4"	5' 8"	7' 1"	4000	
12	Dodge Brothers	9' 7" l 9' 5" r	21' 1" l 19' 1" r	11' 6" l 9' 8" r	21' 11" l 19' 11" r	34° 30' l	9' 6"	"	13' 11"	5' 7"	7' 4"	2884	right and left hand radii differ.
13	Dorris				24' 0"		11' 0"	"	16' 8	5' 10"	6' 4"	4000	
14	Elgin Six	12' 4"	19' 4"	7' 0"	20' 4"	32°	9' 10"	"	14' 0"	5' 6"	6' 5"	2750	
15	Ford Torpedo	12' 6½"	19' 3¾	6' 9¼"	19' 11¾"	32°15'	8' 3"	"	11' 2½	5' 7½"	6' 9"	1540	
16	Ford Sedan	"	"	"	"	"	"	"	"	"	"	1900	
17	Harroun AA-2	6' 4"	14' 6"	8' 2"	15' 6"	40°	8' 10"	"	12' 1"	5' 5"	6' 6"	2240	
18	Hudson Super-Six	15' 3"	22' 3"	7' 0"		28°30'	10' 6"	"	14' 8"	6' 7"	7' 0"	4150*	*Limousine
19	Jackson		21' 0"		21' 8"		10' 1"	"	14' 2"	5' 8"	6' 10"	3500	
20	Jones	15' 0"	19' 0"	4' 0"*	19' 6"	30°	10' 6"	"	14' 0"	5' 8¼"	6' 8"	3240	*does not check
21	Locomobile	17' 8"	27' 0"	9' 4"	28' 0"	29°	11' 10"	4' 8½"	18' 4"	6' 0"	7' 0"	5600	
22	Marmon 34	16' 0"	23' 0"	7' 0"	24' 0"	35°	11' 4"	4' 8"	14' 10"	5' 8 3/16"	5' 9"	3600	
23	" "	"	"	"	"	"	"	"	15' 10"	"	5' 11"	4120	
24	Mitchell F-5-40	15' 5"	21' 10"	6' 5"	22' 9"	30°	10' 0"	"	14' 6"	5' 8"	6' 8½	3430	
25	Milburn Electric		19' 0"			35°	8' 9"	"	11' 6"	5' 6"	6' 10"	2950	
26	Monroe	12' 5"	15' 6"	3' 1"*	15' 10½"		9' 7"	"	13' 4"	5' 9"	6' 9"	2400	*does not check
27	Nash 682		20' 6"			24°	10' 7"	"	14' 8"	5' 6½"	6' 10"	3100	
28	National Sextet							"	15' 4"	5' 9½"	6' 8"	3900	
29	Packard 3-25		22' 6"				10' 8	"	15' 9"	5' 8⅛"			
30	" 3-35		23' 6"				11' 4"	"	16' 5"	"	7' 0¾		
31	Paige-Detroit		20' 9"			36°	9' 11"	"	14' 1"	5' 7½"	6' 5"	3140	
32	" "		23' 0"			"	10' 7"	"	15' 1½"	5' 8"	6' 6"	3690	
33	Peerless				19' 6"		10' 5"	"	16' 2"	5' 7½"	7' 0½"	4225**	**heaviest body
34	Pierce Arrow 38		21' 6"		23' 0"*		11' 2"	"				4370	*Approximate
35	" 48		25' 0"		26' 6"*		11' 10"	"	17' 6"	5' 9"	7' 8"	5103	* "
36	" 66*		29' 6"				12' 3½"	4' 9"	18' 0"		"		*Discontinued Model
37	Pilot						10' 0"	4' 8"	12' 4"	6' 4"	6' 10"	2850	
38	Reo U6	15' 6"	22' 2"	6' 8"	23' 1"	35°	10' 0"	"	14' 1"	5' 7"	6' 8"	3000	
39	Velie 34	16' 0"	23' 8½	7' 8½"	25' 8½	26°	9' 3½"	"	12' 11"	"	"	2650	
40	Velie 48	15' 0"	22' 10"	7' 10"	24' 10"	27°	9' 6½"	"	13' 0"	"	6' 10"	2980	
41	Winton	15' 0"	22' 0"	7' 0"	23' 0"	36°	11' 0"	"	15' 5 5/16	5' 8	6' 9"	4300	
42	"	"	23' 6"	8' 6"	24' 6"	36°	11' 6"	"	16' 2 3/16"	"	7' 2"	4700	

TRUCKS

No.	NAME	Radii				Angle	Wheel-base	Gauge	Length	Width	Height	Weight	Remarks
		Rear In	Front Out	Difference	Extreme								
	Reference Fig. 1	A	B	C-A	C	D	E	F	I	G	H	—	
1	Autocar		19' 3"				8' 1"	4' 10"	15' 0"	5' 9½"	9' 8"	11,000*	*with load + body
2	"		26' 0"				13' 0"	5' 5"	23' 0	7' 0"	"	18,000*	* " " "
3	Bethlehem 3/4 T	13' 4"	22' 7"	9' 3"	23' 0"	30°	10' 5"	4' 8"	15' 10	5' 8"	6' 8"	4,800	
4	" 3½ T	23' 8"	28' 9"	5' 1"	29' 2"	28°	13' 6"	5' 0 9/16"	21' 8"	6' 1 7/16"	8' 1"	16,300	
5	Briscoe					32°	10' 1"	4' 8"	15' 4"	5' 4"	7' 3"	2,900	
6	Chevrolet		22' 0"		22' 11"	33°	10' 5"	"	16' 8"	5' 7"	7' 5¼	3420	
7	Denby 2T	24' 6"	28' 6"	4' 0"*		35°	12' 0"	5' 1¼	18' 2"	5' 10¾		9000	*does not check
8	" 5T	26' 4"	31' 0"	4' 8"*		30°	14' 2"	5' 5"	20' 5"	7' 2½"		20,390	" " "
9	Dorris 2T				30' 0"		12' 0"	4' 10½	18' 3½"	6' 4"	8' 2"	5055	
10	" 3½T*				30' 0"		16' 2"	5' 6"	22' 10½	7' 3½"	8' 8"	6750	*Extra long chassis
11	Federal				25' 0"		11' 0"	4' 8"	16' 8"	5' 5"	8' 1"	4500	
12	"				35' 0"		15' 0"	5' 10½	23' 4"	7' 6½"	8' 7½"	9900	
13	Ford	15' 6"	22' 7"	7' 1"	23' 3"	32°15'	10' 3"	4' 8"	12' 9"	5' 7½"		1480	
14	Garford 2¼T				25' 0"		11' 3"	"	17' 1"	5' 8½"	8' 1⅜"	7400	gross weight
15	" 3½T								21' 9"	7' 2½"		16,150	" "
16	Gramm-Bernstein				29' 0"		13' 6"		17' 1½	5' 9⅝"			
17	International	13' 6"	17' 0"	3' 6"	18' 0"	27°	9' 7"	4' 8"	15' 3"	5' 7¾"	7' 8"	3,700	*does not check
18	"	18' 0"	28' 0"	10' 0"	29' 0"	30°	15' 5"	5' 4½"	20' 8¼	6' 7⅞"	8' 0"	8200	
19	Jackson					30°	12' 6"	4' 10"	20' 2"	6' 0"	"	8000	
20	Monroe						13' 4"	6' 0"	21' 11½	7' 5⅝	8' 6⅜"		
21	Nash 2018		21' 0"			21°30'	10' 10"	4' 8½"	15' 11"	5' 7"	7' 8"	6300	
22	" 3018		23' 3"			"	12' 0"	"	17' 1"	"	"	9360	
23	Packard 5T (6E)				36' 0"		15' 6"		26' 4½	7' 4⅜"	12' 0"		Body 7' 6" wide (spec)
24	Paige-Detroit		38' 0"			30°	11' 8"	4' 8"	18' 0"	5' 11"	+7' 10	8600	
25	" "		42' 0"				13' 4"	5' 0"	21' 0"	7' 2½"	8' 5¼"	15000	
26	Pierce-Arrow 5T								20' 8"	6' 10"	8' 7½"	12,500	Special body 7' 10" wide
27	" " 5T*		56' 0"				17' 0"		26' 8"	"	"		*extra long chassis
28	Reo	16' 5"	23' 8	7' 3"	24' 8"	35°	10' 8"	4' 8"	15' 10"	5' 7"	7' 10"	3220	
29	Selden 1½T						11' 8"	4' 10"				4400	
30	" 5 T*						16' 0"	5' 9½"				11,600	*extra long chassis
31	Traffic Model C	24' 10"	31' 6"	6' 8"	31' 11"	20°30'	11' 0"	4' 8"	17' 9⅜	5' 6"	8' 4"	4150	
32	U.S. 1½T		25' 0"		27' 0"	25°	12' 0"	4' 10"	17' 8	5' 8"	"	4800	
33	" 6 T		31' 0"		34' 0"		14' 4"	6' 1½"	25' 4"	7' 8"	8' 8"	11,000	
34	Velie 1½T		30' 3½"				11' 1"	4' 8"		5' 11"		4850	
35	" 3T		32' 3½"				14' 5½	5' 6¾"		"		9400	
36	White ¾ T		23' 0"			35°	11' 1½"	4' 8"	14' 3"	5' 6⅜		2900	
37	" 5 T		30' 6"			31°	14' 6"	5' 5"	21' 8⅜	6' 2¾		7925	

DIMENSIONS OF AUTOMOBILES

COMPLETE TABULATION OF RETURNS ON QUESTIONAIRE SENT TO AUTOMOTIVE ENGINEERS—MARCH 1920

T.S. ROGERS

crease in the gauge of automobiles while turning sharp corners, is shown on page 173 under the column headed "Differences." In this column figures are arrived at by subtracting the data given for Dimension A in Fig. 1 from the figures given for Dimension C. The fact that several of these differences are less than the normal gauge of the cars indicates that the manufacturers did not interpret the questionnaire properly.

The results of the questionnaire as reported by motor truck engineers were less complete in some respects than those covering passenger cars. Truck engineers were fully prepared with the dimensions of their vehicles relating to body design, but had apparently given little consideration to their turning ability.

Analysis of the turning radii of 29 trucks is shown in Table 7. The extremes vary from 18 ft. to 56 ft., showing that much larger space is required for the handling of motor trucks than is necessary for passenger cars. On private estates it is customary to allow smaller space for service areas used by trucks than for the forecourts and other turn-arounds designed for passenger vehicles. A truck can be turned in from 1½ to 2 times its length, hence an area 40 ft. to 60 ft. square should be ample for an enclosed service court which will be used only by ordinary trucks. It is interesting to note that the first group of cars shown in the table, whose turning radii range from 18 ft. to 24 ft., represent the types of delivery trucks most commonly used by merchants.

The gauge of motor trucks varies considerably from the standard of 4 ft. 8 in. commonly adhered to by passenger vehicles. Table 8 shows that nearly half of the trucks reporting have standard gauge, while the others range from 4 ft. 10 in. to 6 ft. 1½ in.

The length of trucks shows considerable variation. The smallest truck given in the tabulation is only 12 ft. 9 in. long and the largest truck, which has an extra long chassis, is 26 ft. 8 in. in over-all length. Between these two dimensions the other cars are fairly well distributed. Trucks of extra long wheelbase, designed for carrying special loads like lumber, seldom have occasion to enter an estate, and are therefore not to be seriously considered in estate design. Table 9 gives an analysis of the length of trucks.

The width of commercial vehicles varies from 5 ft. 4 in. to 7 ft. 8 in. as shown in Table 10. Bodies for special purposes are seldom made by truck manufacturers, but are built to order by body makers — hence these dimensions do not indicate the extremes which are reached. One furniture van which was measured by the writer was 7 ft. 10 in. wide.

Table 11 shows the height of trucks. They vary from 6 ft. 8 in. to 12 ft. The wide difference reported is accounted for by the fact that truck manufacturers only give the height of the drivers' cabs, and the bodies frequently extend much above this point. The 12-ft. dimension reported included a special enclosed body similar to those used by furniture movers.

The weight of the trucks reported varies from 1,480 to 20,390 pounds. In most instances these weights include the permissible load and body. Extremely low weights are evidently of the chassis only. The greatest weight indicated is not the limit of weight reached by motor vehicles, as certain manufacturers are producing standard 7½-ton trucks and in special instances (such as for road making machines) they have produced 10-ton trucks.

This inquiry, when compared with one made in 1911 by Arthur C. Comey, shows interesting tendencies in truck design. Mr. Comey, in his article in *Landscape Architecture*, July, 1911 (Vol. 1, No. 4), reported the results of an investigation covering 44 manufacturers of trucks. At that date several manufacturers stated that "widths beyond 7 ft. render trucks difficult to handle in crowded streets and likely to be overloaded."

The width of 1-ton trucks varied from 5 ft. to 6 ft. 4 in. for standard machines. For 5-ton trucks the widths ranged from 6 ft. to 7 ft. 2 in. One 10-ton truck was reported having a standard width of 7 ft. 9 in. Special inquiry showed some remarkable extremes in the width of certain vehicles. Five manufacturers reported products exceeding 8 ft. in width, the extreme dimension being 9 ft. 6 in. Such great width is now prohibited in certain states and will probably not ever become common because of this fact.

In passenger-car design recent tendencies seem to indicate a reduction in height in nearly all classes of cars. In the more expensive cars some increase in length may be noted. Reduction in weight is a popular demand for the sake of economy. Handling ease, which means small turning radii, has very recently become a selling point both in cars and trucks, and it seems probable that more and more attention will be paid by designers to this feature.

Average dimensions have not been computed for the reason that averages are dangerous to use for design purposes. Extreme dimensions should be used in the design of accommodations for automobiles wherever possible. Where economy is of paramount importance the character of the vehicles to be provided for should be carefully considered and dimensions selected which will bar only the cars least likely to require accommodation.

Heating and Ventilating

PART III.

ELECTRICAL HEATING AND FACTORS DETERMINING SELECTION OF SYSTEM

By C. W. KIMBALL

ELECTRICAL heating, like gas and kerosene, is (due to the cost of supply as compared to coal and wood) used mainly as an auxiliary for the quick heating of rooms, show windows and comparatively small enclosed spaces.

The safety with which electric units may be used, their positive lack of odor, and absolute control of heat makes electricity of extreme value where auxiliary heating is required.

As heating units we have several types, each filling a special requirement.

1. Grid or car heater type of varying sizes consuming from 1,000 to 10,000 watts per hour. These are mainly installed in fixed locations and controlled by means of large switches. They may be in the room to be heated or may be set in the basement and air drawn over them similar to indirect radiation.

2. The luminous type consisting of special type of frosted incandescent lamps set in a receptacle in front of a copper reflector. These serve the double purpose of heat and light to a certain extent.

3. The electric log consuming from 500 to 1,000 watts per hour, having a heating element partly concealed in an artificial log of refractory material and generally set in fireplaces.

4. The projecting reflectory type consuming from 500 to 1,000 watts, having an incandescent coil set in a parabolic polished reflector with suitable wire guard. This type projects the heat in one direction and has been found very efficient for this use.

5. The combined type consisting of a sectional radiator of the same general appearance as the radiators used with steam-heating systems. Such radiators are portable and of different sizes, consuming from 500 to 4,000 watts per hour, depending on the number of sections. These radiators are partly filled with liquid in which a heating unit is immersed. They are efficient and safe in all locations.

Electric heating due to cost of current in most sections of the country is limited mainly to the following uses and probably will not be in general use until such a time as electricity can be sold at about one-fourth its present cost:

1. For the heating of lodge or other rooms, or spaces which are but seldom used and for a few hours only at a time, where the question of labor in maintaining a steam plant for such intermittent service is an important item.

2. Where electricity can be generated by means of water power, as on some private estates, and under conditions when the cost of producing such power is small, or when the question of cost can be disregarded.

3. Where heat is needed occasionally in addition to the regular system.

4. Where heat of absolutely uniform temperature is desired in industrial work.

5. In hospitals and homes where auxiliary heat is required for a short time or for heating water, pads or other devices.

Selection of a Heating System

Some of the main points to be considered in the selection of a heating system for any building are as follows:

1. Size and location of building.
2. Use of building.
3. Adaptability.
4. Owners' desires or preferences.
5. Operating costs.
6. First cost.

Small residences, churches, schools, halls and buildings of like nature unless heated from central plants are generally heated by furnaces after due consideration of the above points.

Larger buildings generally require the use of hot water or steam systems of one form or another. Here the preference of the owner and the first cost many times are the deciding factors with very little attention paid to the efficiency of the system selected. If the choice is not fixed by these points, it is well to remember that vapor systems or gravity hot water systems are well adapted to all residential work, all ordinary schools, halls, shops, etc.; while for the large projects, especially where the buildings are spread out, the vacuum or forced hot water heating systems are preferable. Garages, factories, storehouses and buildings of that class are especially adapted to the use of the combined heating and sprinkler system where the use of sprinklers is necessary.

BOILERS. — The boilers or heaters occupy the same place with reference to a building as the heart does to the human system, and unless care and judgment are used in the selection of the boiler, the heating results in every way will be

unsatisfactory. In determining the size and kind of furnaces or heaters to be used, the foregoing six points must be considered. After the kind and type of heater are determined, the size is the most important point, and too much cannot be said to emphasize the necessity of having heaters sufficiently large. Be sure, always, to get them too large rather than too small. Don't economize on the heart of the system and endanger the success of the whole.

In determining the size of the hot water or steam boiler or boilers to be used, do not rely on the ratings published in catalogues. For housework and other small systems, a safe way is to double the radiation and select a boiler rated at a little more than this result. Another way on larger work is to reduce the load to direct radiation equivalent by taking the direct cast-iron radiation at its face value. For pipe coils add 20 per cent; direct-indirect, add 33⅓ per cent; gravity indirect, add 50 per cent; accelerating coils, add 50 per cent, and fan-coil surface multiply by 4, 5, 6, 7 or 8, dependent on the velocity and temperature of air passing through the coils — a fair average being 5 or 6. Add these various figures together and allow approximately 25 per cent for heating surface in the covered steam mains and in the risers, and then select a boiler or boilers one or two sizes larger than the resulting figure would indicate.

Be sure that the chimney is of ample capacity to care for all the heaters, and that it extends well above any other part of the building. Poor draft is sure to result in excessive coal consumption and will prevent a properly selected boiler doing its work efficiently.

Radiation. — In determining the type of radiation to be used for heating surfaces, the available space is likely to be the greatest factor. In the better class buildings, many times it is necessary to use indirect radiation or to conceal the direct radiation in slots behind grilles.

To determine the necessary amount of radiating surface, there are many rules in use, all of which must be used with experience and judgment. One of the simplest possible approximate rules is the 2-20-200. This is applied by dividing the total exposed glass surface by 2, the exposed wall surface by 20, and the cubic contents of room by 200; these results added together will give the amount of radiation for south rooms. Add 15 per cent for the north rooms and 10 per cent for the east and west rooms.

Another and more carefully worked out calculation is the Chicago method, as follows:

Schedule for computing minimum quantities of steam radiation at 70 degrees F. with the outside temperature at 10 degrees F. below the zero point:

1 foot of radiation for every 300 cubic feet of contents, plus
1 foot of radiation for every 15 square feet of net exposed wall, plus
1 foot of radiation for every 2 square feet of glass surface.

For all rooms with plastered ceilings and unheated air space between ceiling and roof, add 1 square foot of radiation to every 30 square feet of ceiling area.

For all rooms with ceiling plastered on roof joists, add 1 square foot of radiation to every 20 square feet of ceiling area.

For all rooms with ceiling of open joist or concrete roof construction, add 1 square foot of radiation to each 10 square feet of roof.

For all rooms with northeast or northwest exposures, add 10 per cent additional radiation.

Where radiators are placed under seats or behind grilles, add 20 per cent additional radiation, and when placed in open recesses, add 10 per cent additional radiation.

For indirect radiation, add 50 per cent additional.

For direct-indirect with fan system, add 25 per cent additional radiation.

In measuring glass surface the full opening in the wall should be figured. Outside door openings should be taken as glass.

For computing minimum quantities of hot water radiation, add 60 per cent to amount necessary for steam.

For computing minimum quantities for vapor systems, add 20 per cent to amount necessary for steam.

A vapor system is defined as a two-pipe steam system which has the return lines open to atmosphere, with no valve at the return connections of the heating units which will close against steam.

For heating to temperatures other than from minus 10 degrees to 70 degrees, multiply above quantities by the following coefficients:

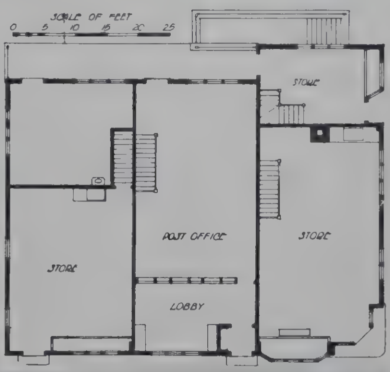
—10 to 65	.94
—10 to 60	.87
—10 to 55	.81
—10 to 50	.75
—10 to 45	.69
—10 to 40	.62

The above schedules of quantities are commensurate with good heating results for the *average* building of *average* construction, but by no means to be construed as guarantees of the proper quantity of radiation necessary to heat every building, as extraordinary conditions will of course require additional radiation.

A Small Suburban Store Building at Southboro, Mass.

CHARLES M. BAKER, ARCHITECT

THE building illustrated herewith indicates the charm that simple store buildings may have when they receive some architectural consideration. An interesting fact in connection with the design of this building is that it was built on the exact foundations of an old building that had been destroyed by fire, and although exactly square in plan to suit the conditions, there is no suggestion of the cube in its exterior appearance.



EDITORIAL COMMENT

ANY promise of more stable conditions in the ranks of labor connected with the building industry to-day forms a bright spot on the architect's horizon. If building projects on which architects have spent much time and thought have successfully withstood the onslaught of high material prices, it is rare that they have not had to contend with the peculiar and insistent demands of labor before reaching completion. It is, therefore, with some degree of relief that the first findings of the recently formed National Board of Jurisdictional Awards are received, for there is now a definite promise of relief from the many irritating and senseless disputes arising between rival unions over the division of work that have in the past consumed valuable time and wasted large sums of money.

It will be recalled that at the last Convention of the American Institute of Architects the members of the Institute were bound to observe the awards of this national board, which has been organized through the patient efforts of the Institute working with the Building Trades Department of the American Federation of Labor, Engineering Council and the Associated General Contractors of America.

The findings of this board have particular interest for architects in that they govern the division of contract work as noted in specifications. In accordance with the agreement made by the Institute with the associated organizations, members of the Institute are required to observe the rulings in the preparation of their specifications, and other architects are morally bound to recognize them in order to lend their assistance to establishing the awards and also to avoid labor difficulties on work which is under their direction.

The following decisions were reached at the first meeting of the board held recently in Washington.

Air Coolers. Section I. All sheet metal work of No. 10 gauge, or lighter, used on air washers, fans, blowers, or the housing of same, shall be recognized as being the work of the Amalgamated Sheet Metal Workers International Alliance. Section II. All pipe fitting in connection with preceding is awarded the steam fitters, represented by the United Association of Journeymen Plumbers, Steam Fitters and Steam Fitters' Helpers.

Corner Beads. Plasterers, represented by the Operative Plasterers' and Cement Finishers' International Association, are awarded jurisdiction over metal corner beads, secured to the structure with a plastic material.

Cutting Chases. In the dispute between bricklayers and electrical workers, jurisdiction of cutting of grooves, channels, chases in brickwork, etc., is given to the bricklayers where such chases exceed 2 x 2 ins. in size or require labor in excess of eight continuous hours. Work less than this is awarded the electricians.

Electrical Work on Elevators. Electrical work on flashlights, electrical annunciators, lamps and feed wires to the controller is awarded the electrical workers. All other work is awarded the elevator constructors.

Low Pressure Heat. Regarding the question of heat in buildings during construction, jurisdiction is given the steam fitters until the initial test is completed, immediately after which time, if heat is necessary, a stationary engineer shall be employed by owner or contractor.

Metal Glazing. All glass set in sheet-metal sash, frames, doors or skylights shall be set by members of the Brotherhood of Painters, Decorators and Paperhangers of America; all sheet-metal work on sheet-metal sash, frames, doors and skylights shall be done by members of the Amalgamated Sheet Metal Workers' International Alliance.

Pipe Railing. Pipe railing, consisting of standard sized cut and threaded pipe not used in connection with structural or ornamental iron work, is awarded to the United Association of Plumbers and Steamfitters.

Reinforcing in Concrete. All iron and steel work for reinforcement in reinforced concrete, cement and floor construction shall be done by members of the Iron Workers' International Association.

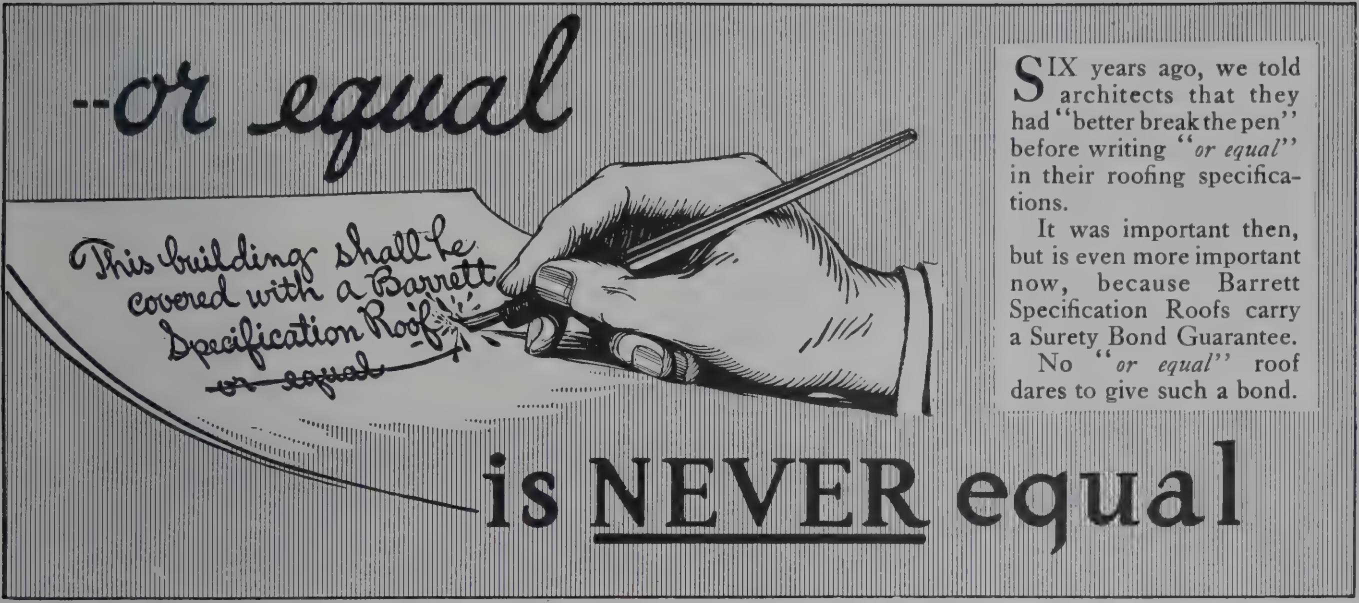
Vitrolite and Other Opaque Glass. The setting of this type of glass is awarded to the Bricklayers', Masons' and Plasterers' International Union.

STANFORD WHITE MEMORIAL

THE memory of the late Stanford White is to be perpetuated through the erection of a pair of bronze doors which the friends of the distinguished architect will present to the New York University Library, designed by Mr. White.

The doors will be unique in that they will contain a number of medallions symbolizing Art, the original of which will be contributed free by a number of sculptors formerly associated with the architect. The design has been entrusted to Laurence Grant White, son of Stanford White.

It is the purpose of the committee in charge to appeal for funds solely from friends and admirers of the late architect. Funds destined for the memorial may be addressed to W. Francklyn Paris, 7 West 43d street, New York.



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Manufacturers' Catalogs and Business Announcements

CATALOG REVIEWS

American Face Brick Association, 110 South Dearborn street, Chicago, Ill.
"The Home of Beauty" (8 x 11 ins.). 72 pp.

One of the most ambitious forms of industrial expression in amplifying the proper and less expensive uses of its product is this collection of fifty small brick house designs issued in book form. It is interesting to know that in a competition authorized by the above association there were three hundred and sixty odd competitors for the honors conferred by the jury of award. These judges were chosen from the field of small residence designers for their familiarity with the problem. The exacting program of requirements likewise had to be drawn up with a close knowledge of the essentials of house planning.

The product of elimination — the ten prize designs and forty others, specially chosen — are shown by sketches and plans, together with two valuable articles for home builders in these pages. A versatile handling of the major material — face brick — and an up-to-the-minute viewpoint as regards plan bring before the architect an assimilation of the elements that have been dwelt upon by patrons, designers and judges.

The General Fireproofing Company, Youngstown, Ohio.
"General Fireproofing," Monthly (8½ x 11 ins.). 14 pp.

The house organ of the above concern known for the last four years as "General Fireproofing," and circulated in the interests of its agencies, will now be pursued by the parent organization as its own. A recent issue shows two articles on the architecture of country houses in which stucco is the medium. Of these, one is an actual description and the other approaches the subject in an analytic vein, which enhances the interest. Two articles are devoted to fireproofing and planning of the home. An attractive frontispiece and a busy editorial page leave little of the contents for the usual manufacturers' propaganda. The editor states that the majority of pages will be devoted to promoting good will and in dispensing information without advice. One humorous page and a half entitled, "Walls That Stand," an epic on the founding of Rome, provides enough light text to leave the reader in a genial mood.

"Gas Age," 52 Vanderbilt avenue, New York, N. Y.
Special Issue. "Heating."

House heating with gas, which makes it possible to automatically heat the home from October to May without any of the bother of ashes and coal, is fully described in a recent issue of the above journal. Gas for fuel may be used with any standard system of heating such as steam, hot water, vapor vacuum or warm air. Installations of each kind are described and illustrated, and the accompanying data gives the necessary engineering information and comparative costs for the architect to form reasonable conclusions. In addition to this the various systems by which gas is sold in the United States are described. These are the block system, the secondary rate system and the special rate system, which make it possible to use gas at a lower or only slightly greater cost than coal, depending on the system used.

ANNOUNCEMENTS

W. Whitehill, architect, announces the removal of his office to 12 Elm street, New York City.

Arthur B. Heaton announces the admission to partnership of E. Burton Corning for the practice of architecture, with offices at 210-214 Maryland Building, 1410 H street, Washington, D. C., under the name of Arthur B. Heaton, architect.

Raymond D. Weekes has opened an office for the practice of architecture at 501 Bloomfield avenue, Montclair, N. J., and will be pleased to receive manufacturers' catalogs and samples.

Edward C. Van Leyen and Edward A. Schilling, architects, and Henry J. Keough and Robert A. Reynolds, engineers, announce their association under the firm name of Van Leyen, Schilling, Keough & Reynolds, with offices at 556 Cass avenue, Detroit, Mich.

Edgar and Verna Cook Salomonsky have opened offices for the practice of architecture at 368 Lexington avenue, New York City.

Howell & Thomas, architects, announce the removal of their offices from 2032 Euclid avenue, Cleveland, Ohio, to 1400 Euclid avenue.

Ellery K. Taylor announces the opening of an office for the practice of architecture at 1627 Sansom street, Philadelphia, Pa. Manufacturers' samples and catalogs requested.

Fulton & Taylor and Paul T. Cahill announce the formation of a new partnership under the name of Fulton, Taylor & Cahill, architects, and the removal of their office after Apr. 1, 1920, from 631 Hippodrome Building to 8120 Euclid avenue, Cleveland, Ohio.

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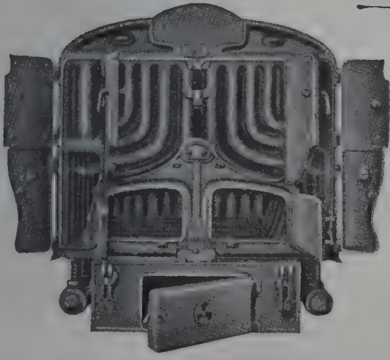

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The publications listed in these columns are the most important of those issued by leading manufacturers identified with the building industry. They may be had without charge by addressing THE ARCHITECTURAL FORUM, 85 Water Street, Boston, Mass., or the manufacturer direct, in which case kindly mention this publication.

BRICK

American Enameled Brick and Tile Co., 52 Vanderbilt Avenue, New York.
Enameled Brick. Circular. Illustrated.
Fire Brick. Circular. Illustrated.

American Face Brick Association, 1151 Westminster Building, Chicago, Ill.
The Story of Brick. Booklet. 7 x 9¼ in. 55 pp. Illustrated. Presents the merits of face brick from structural and artistic standpoints. Tables of comparative costs.
The Home of Beauty. Booklet. 8 x 10 in. 72 pp. Color plates. Presents fifty designs for small face brick houses submitted in national competition by architects. Text by Aymar Embury II, Architect.

CEMENT

Atlas Portland Cement Company, The, 30 Broad Street, New York.
Color Tones in Stucco. Booklet. 8½ x 11 in. 24 pp. Color plates. Describing the possibilities of toning stucco by the use of color aggregates. Examples and specifications.
Non-Staining Mortar for Pointing, Setting and Backing. Booklet. 8½ x 11 in. 28 pp. Illustrated. A treatise on good mortar. Specifications.
Cast Stone. Booklet. 8½ x 11 in. 28 pp. Illustrated. Showing some of the possibilities of cast stone.
Appropriate War Memorials. Booklet. 8½ x 11 in. 12 pp. Illustrated. Examples of what has been done in concrete and cast stone.

Muller, Franklyn R. Co., Waukegan, Ill.
Everlastic Magnesite Stucco. Booklet. 8½ x 11 in.

Sandusky Cement Co., Engineers' Building, Cleveland, Ohio.
Medusa White Portland Cement, Stainless. Booklet. 8½ x 11 in. 48 pp. Illustrated.
Medusa Waterproof White Portland Cement. Booklet. 6 x 9 in. 32 pp. Illustrated.
Medusa Review. 6 x 9 in. 18 pp. Illustrated. House organ issued bi-monthly.

United States Materials Co., 1551 Kingsbury Street, Chicago, Ill.
Elastica, the Stucco of Permanent Beauty. Catalog. 8½ x 11 in. 32 pp. Illustrated. Treatise on composition and application of Elastica Stucco.

CONDUIT

National Metal Molding Co., 1113 Fulton Building, Pittsburgh, Pa.
Bulletin of all National Metal Molding Products. In correspondence folder. 9½ x 11½ in.
Sherarduct. Circular. 5 x 8 in. Illustrated.
Flexsteel. Circular. 5 x 8 in. Illustrated.

CONSTRUCTION, FIREPROOF

General Fireproofing Co., The, Youngstown, Ohio.
Fireproofing Handbook. Catalog. 6 x 9 in. 112 pp. A book dealing with the problems of fireproof construction, using as a basis the reinforcing materials—Self-Sentering, Trusset and Expanded Metal.
Metal Lath Self-Sentering. Booklet. 8½ x 11 in. 36 pp. A reinforcement for concrete floors, roofs and walls.
General Fireproofing. 8½ x 11 in. 16 pp. House organ issued monthly.

Northwestern Expanded Metal Co., 934 Old Colony Building, Chicago, Ill.
Fireproof Construction. Catalog. 6 x 9 in. 72 pp. Illustrated. Handbook of practical suggestions for architects and contractors. Describing Nemco Expanded Metal Lath.

DOORS, WINDOWS AND TRIM, METAL

Merchant & Evans Co., 2019 Washington Avenue, Philadelphia, Pa.
Evans "Almetl" Fire Doors and Shutters. Catalog. 8½ x 10¾ in. 24 pp. Describes the entire line including "Star" Ventilators.

DOORS, WINDOWS AND TRIM, WOOD

Curtis Service Bureau, 503–603 S. Second Street, Clinton, Iowa.
Architectural Exterior and Interior Woodwork, Standardized. Catalog. 9 x 11½ in. 238 pp. Illustrated. Covers a complete line of architectural woodwork, standardized both as to designs and sizes.

Morgan Sash and Door Co., Chicago, Ill.
The Door Beautiful. Catalog. 8½ x 11 in. 50 pp. Color plates. Showing doors in appropriate interior settings.
Masterpieces of Doorcraft. Catalog. 6⅞ x 8 in. 23 pp. Color plates. Doors and types of architecture for which they are appropriate.
Adding Distinction to the Home. Catalog. 5 x 7⅜ in. 32 pp. Illustrated. Showing a number of entrances, various uses of French doors, mirror doors, flush doors, etc.

Stearns Lumber Co., A. T., Neponset, Mass.
Catalog "K." 9 x 12 in. 80 pp. Illustrated. Covering the entire line of exterior and interior finish, including Stearns' "Florida-Gulf" Cypress.

DUMBWAITERS

Kaestner & Hecht Co., Chicago, Ill.
Bulletin 520. Describes K. & H. Co. electric dumbwaiters. 8 pp.

Sedgwick Machine Works, 151 West 15th Street, New York.
Catalog and Service Sheets. Standard specifications, plans and prices for various types, etc. 4¼ x 8¼ in. 60 pp. Illustrated.

ELECTRICAL EQUIPMENT

Hart & Hegeman Mfg. Co., The, 342 Capitol Avenue, Hartford, Conn.
Catalog "P." 4¾ x 6¼ in. 183 pp. Illustrated. H. & H. Switches and Paiste Wiring Materials.

Prometheus Electric Co., 511 West 42nd Street, New York.
Electrical Equipment. Booklet. 6 x 9 in. 5 pp. Illustrated. Electric plate warmers, sterilizers and mechanical heating devices.

Simplex Wire & Cable Co., 201 Devonshire Street, Boston, Mass.
Simplex Manual. Catalog and reference book. 6¾ x 4¼ in. 92 pp. Contains in addition to information regarding Simplex products, tables and data for the ready reference of architects, electrical engineers and contractors.

Western Electric Co., 195 Broadway, New York.
Western Electric Electrical Supply Year Book. Catalog. 6½ x 9½ in. 1248 pp. Illustrated. Listing equipment for every electrical need for homes, institutions, office buildings and industrial plants. Prices for estimating included.
Western Electric Flip Switches. Folders. Illustrated. Listing a complete line of lighting switches operated by levers thrown up or down.
Western Electric Decorations for Duplexalites. Booklet. 6½ x 9½ in. 8 pp. Illustrated. Listing a great variety of shades and decorations in parchment, silk, etc., for standard Duplexalites.

ELEVATORS

Kaestner & Hecht Co., Chicago, Ill.
Bulletin 500. Contains 32 pp. Giving general information on passenger elevators for high buildings.

Sedgwick Machine Works, 151 West 15th Street, New York.
Catalog and descriptive pamphlets. 4¼ x 8¼ in. 70 pp. Illustrated. Descriptive pamphlets on hand power freight elevators, sidewalk elevators, automobile elevators, etc.

FLOORING

Armstrong Cork Co., 132 West 24th Street, Pittsburgh, Pa.
Linotile Floors. Catalog. 6 x 9 in. 40 pp. Color plates. Describes Linotile, a composition of ground cork, wood flour, linseed oil and various gums and pigments in tile form.
The Ten-Point Cork Floor. Booklet. 3½ x 6 in. 16 pp. Shows design panels in color for Cork Tile floors.

Armstrong Cork Co. (Linoleum Dept.), Lancaster, Pa.
Armstrong's Linoleum Floors. Catalog. 8½ x 11 in. 54 pp. Color plates. A technical treatise on linoleum, including tables and specifications for installing linoleum floors.
The Artistic Possibilities of Armstrong's Linoleum Floors. Booklet. 11¼ x 16½ in. 12 pp. Color plates.
Armstrong's Linoleum Pattern Book, 1920. Catalog. 3½ x 6 in. 176 pp. Color plates. Reproductions in color of all patterns of linoleum and cork carpet in the Armstrong line.
Quality Sample Book. Three books. 3½ x 5¾ in. Showing all grades and thicknesses in the Armstrong line of linoleum and cork carpets.

Johns-Manville Co., H. W., New York City.
A Flooring That's "Made to Fit." Booklet. 3½ x 6 in. 14 pp. Illustrated. Descriptive of Johns-Manville Asphalt Mastic Flooring.

Muller Co., Franklyn R., Waukegan, Ill.
Asbestone Composition Flooring. Circulars. 8½ x 11 in. Description and Specifications.

FLOOR HARDENERS

Anti-Hydro Waterproofing Co., 299 Broadway, New York.
Floor Hardening. Circular. 6½ x 8½ in. 4 pp. Describes an inexpensive method for producing permanently smooth, dustless and wearproof floors.

Sonneborn, Sons, Inc., L., 266 Pearl Street, New York.
Concrete and Lapidolith. Booklet. 5⅜ x 8⅛ in. 24 pp. Illustrated. Describing relation of Lapidolith chemical floor hardener to concrete construction.
Why Lapidolize? Booklet. 8½ x 11 in. 11 pp. Illustrated. Reasons why Lapidolith should be specified.
Lapidolith Specifications. Circular. 8½ x 10¾ in. 2 pp.

Truscon Laboratories, The, Cor. Caniff Avenue and Grand Trunk R. R., Detroit, Mich.
Agatex and Its Performances. Booklet. 8½ x 11 in. Describes the methods of hardening concrete floors by the application of a chemical which forms a new surface as hard as agate.

HARDWARE

Casement Hardware Co., The, Clinton and Madison Streets, Chicago, Ill.
The Casement Window Handbook. 4¼ x 5¼ in. 31 pp. Illustrated. Treatise on the outswung English casement window showing details of screen and inside operated adjusters.

THE ARCHITECTURAL FORUM

VOLUME XXXII NUMBER 5

CONTENTS for MAY 1920

PLATE ILLUSTRATIONS

LETTERPRESS

ALBERT J. MacDONALD, Editor

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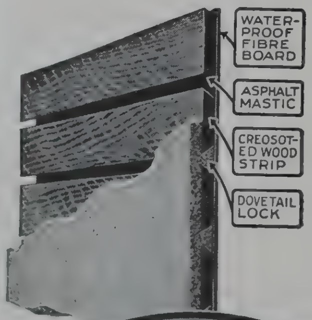

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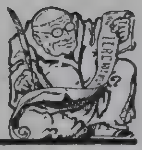

A NEW PUBLICATION TO AID IN WIDER APPRECIATION OF ARCHITECTURE

FOR twenty-eight years Rogers and Manson Company, publishers of THE ARCHITECTURAL FORUM, has been closely identified with the interests of the architectural profession. It has steadily labored for an enlargement of the profession's activities and has enjoyed great pleasure and inspiration in recording over these years the consistent development of architecture in this country. It has, in common with the members of the profession, an intense desire to see the value of architecture more widely recognized, especially in the field of low-cost building, where the need is so great. Believing that the years immediately ahead hold either great danger to the art of architecture or great opportunity for its advancement, according to the influences brought to bear on building development, it has begun the publication of *The Builders' Journal* to provide a medium for the dissemination of knowledge regarding taste and design in building to the moderate-cost building contractor, who holds power for good or evil in accordance with the degree of appreciation for good design and building he possesses.

For many years architects have regretted the low estate to which the architecture of the typical American small house has fallen. It has been commented on at each recurring convention of the American Institute of Architects, yet a practical means of giving actual help to the small property owner has not been devised. It is obviously impossible for the architect to devote his time to the designing of small houses because of the disproportionate relation between the cost of doing the work and the fee he receives for it, and it is unfortunate that in but very few instances the owner recognizes the value of the service and is ready to pay the usual 6 per cent fee.

The annual amount of this work is estimated variously, but it is generally conceded that 90 per cent of the small buildings of the country are erected without any architectural assistance. In the present distressing conditions surrounding the building industry the proportion of building without architectural design will probably be even greater because of the difficulty of justifying the additional overhead cost which the architect's fee imposes. This great mass of work will continue to be done by the speculative builder, the real estate developer, and the building contractor employed directly by the owner. It is not logical to expect the standard of design to be higher than the abilities and opportunities of those responsible for it permit; the builder has no architectural training, he frequently has no perception of good taste, his opinion of design is prejudiced by having too close a connection with construction, and his chief aim is to get out of his obligations as cheaply as possible with no thought of appearance or plan except that necessary to cater to the stereotyped fashions that appear about every decade.

Why this state of affairs should exist is difficult to explain; it is undoubtedly the result of the introduction of machinery for producing building materials in quantities, with a resulting deterioration of individual craftsmanship which had previously been responsible for the simple and beautiful forms of building that prevailed in the days of the eighteenth and early nineteenth centuries. Whatever the cause, the condition exists and has been responsible for making the average American small town the most dreary place of habitation. Every architect wishes for some agency which would be instrumental in preaching the worth of beauty. There is to-day no greater power for wide influence than the press; but, like other commercial agencies, it only grudgingly recognizes the artist, and it is in reality responsible more often for spreading ugliness than beauty because it is not properly guided in its efforts.

Recent years have seen, however, remarkable improvements in the periodicals devoted to home building that circulate among the general public. They have had an important influence, but, in reality, their influence hardly extends beyond cultured people, who might in any case be expected to exercise reasonable judgment in matters of taste in building. The great mass of building remains untouched, and this element, most important because of its size, can only be reached through the builder who has to-day, and will continue to have, its control in his hands. Even if the public itself could be reached in an effective manner much of the good accomplished could be undone by the veto power of the builder. The owner, no matter how enthusiastic he may have become for beauty in his home, in the usual course of events looks to the builder to supply it, who, in order to simplify his problem, raises "practical" objections to the thought of anything different.

It is to stimulate an interest in better building, better design, and better craftsmanship that *The Builders' Journal* is published. It is the further hope that a vigorous prosecution of this program will also create on the part of the builder a better appreciation of the results for which the architectural profession sincerely labors.

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The
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VOLUME XXXII MAY 1920 NUMBER 5

The American Institute of Architects' Convention

WASHINGTON, D. C., MAY 5, 6 AND 7

THE annual conventions of the American Institute of Architects are always of interest in that they provide an index of the conditions affecting architecture and its practice in the various parts of the country, through the exchange of experiences enjoyed by the delegates. The influence and importance of the recurring meetings may be attributable more perhaps to the opportunity they present, in the brief respite from the details of practice, for informal appraisals of effort and for the pleasant acquaintances that are renewed, rather than to any weighty matters that are discussed or settled. The recent convention proved no exception to established custom, and after recalling the work of the three days' meetings, it is difficult to record the net accomplishment as being any great addition to our fund of architectural knowledge, or contributing any clear guide in pursuing the difficult path of practice, or providing a stimulus for a wider extension of architectural activities.

It is the more remarkable, too, that so little enthusiasm was shown for the larger opportunities the future holds for architecture through concerted effort of the profession, for there was perhaps never a period in the world's history in which the value of organized effort was so generally recognized as it is to-day. This convention did differ from previous ones in that the dominant spirit of the day was noticeably absent. One needs only to recall the convention at Philadelphia in 1918 and the convention at Nashville last year to know that national economic and political conditions can affect an Institute convention. Those were years of doubt and uncertainty, and perhaps, as one delegate expressed it, it is true of architects that they are active in their associated welfare only in times of depression. There was no ringing call to bring architecture to the forefront of the great social and economic development this country is about to enter. There were many references to service, but they lacked the power and confidence that should accompany a statement of purpose of the architectural profession to-day. It might be assumed that intimate contact with the capital city, which is favored with so many worthy architectural monuments, would prove effective in creating inspiration to strive for a larger place in to-day's life, but it was rather the deadening effect of official Washington and the uninspiring rôle of super-conservatism that was successful in imparting color to the convention.

The foregoing may indicate that no progress in the development of architecture and its practice was evident, and if it should, that would be creating an impression wholly untrue. There was evidence of progress, but it cannot claim any great mark of recognition, when it is compared, as it is most natural to do, with the results that should have marked a national convention at so important a period in the modern development of the profession. There was at various times promise of discussion that would lead to a larger viewpoint; there was general approval of references to the larger work of the Institute, but they died away without tempting the delegates to visualize the opportunities that lie ahead.

The chief interest for most of the delegates centered on the report of the Post-War Committee. The work of this committee has been productive of much concentrated thought, and it has brought the Institute in closer touch with architects not members of the Institute, and with the representative bodies of other professions in a way no former effort ever achieved. The moving spirit behind the Post-War Committee movement has been President Kimball, and in his opening address to the convention, his satisfaction with the work accomplished and his confidence in the results yet to be produced were warmly expressed.

The first session on Wednesday, May 5, was largely taken up by the treasurer's and board of directors' reports, following which was presented the report of the Post-War Committee, of which N. Max Dunning of Chicago was chairman. The general accomplishment of this committee has been the careful compilation of opinions emanat-

ing from architects in various phases of practice with reference to relations as they exist and as they should exist between other architects, engineers, contractors, clients and society in general. It has been instrumental in calling forth a great deal of discussion of important questions with reference to architectural service that has been productive in aiding the profession to re-establish itself following the war, and to meet new conditions in practice that have been particularly evident since the general resumption of business.

Some of the detailed results of the committee's work cover the following fields: registration laws, state architectural societies, co-operation with related interests, improvement of service, professions and education. Summarizing the work briefly, the committee has secured practical data on registration laws which it has placed, with suggestions for procedure to secure such laws, in the hands of individuals and organizations in practically every state. It has prepared a bulletin setting forth the desirability of organizing state societies of architects and has formulated a tentative model constitution and by-laws that could be placed at the disposal of groups of architects interested in forming such societies. The work along co-operation with related interests, covered meetings with contractors' organizations and the Engineering Council, which hold promise of greater coördination of architects and these other important factors of the building industry.

The most outstanding work of this character is the National Board of Jurisdictional Awards, which is now favorably known to the profession and the building industry. It is gratifying that this important work in the abolition of strikes in the building trades should be inaugurated by architects. The work has been most ably carried out by the Institute's committee chairman, E. J. Russell of St. Louis, and the general approval of his work is attested by the fact that he has been made permanent chairman of the national board.

Under the topic, "Professions," the most important object attained was the organization of the Inter-Professional Conference held at Detroit, November 28 and 29, 1919, at which the representatives of fourteen professions formed a national organization which promises to develop means whereby the service of each profession may be improved and their combined efforts exert a more beneficial influence on public affairs.

The great amount of tabulated data and the conclusions of the committee have been turned over to the Institute, and the committee disbanded, although the results of its work are so arranged that they can be followed to definite conclusions by a regularly constituted Institute committee.

It must be noted in passing that many of the problems which it was generally thought the committee would discuss to a conclusion and tender definite proposals, either confirming the wisdom of present practice or suggesting alternative methods, are still left in an undecided stage and covered only by a statement from the committee that further study of them is suggested. Possibly the details of architectural practice, relation of architects to society, the function of the Institute and other similar questions are too complex to enable any group of men to arrive at a tentative answer to them, but some definite suggestion pointing to a solution does seem to an observer possible of attainment.

There was no particular subject that stood out as the leading topic of the convention, the questions discussed covered the whole range of Institute activities from details of official procedure to plans for public service of the profession. The committee work and related matters that were referred by the board of directors to the convention for action included education, the Institute Press, structural service, state societies and regional representation on the board of directors. The last is a suggested arrangement whereby the United States would be divided into nine sections, each of which would be represented on the board by a director chosen by the respective districts, three to be elected annually as now.

The work of publishing the Institute *Journal* will now be carried on by the newly incorporated American Institute of Architects' Press, managed by a board of five directors elected by the Institute board. The Press is well financed and the *Journal* should enjoy as a result a wider opportunity for service.

The evening of the first day was given over to the first National Architectural Exhibition, held under the direction of the Institute at the Corcoran Art Gallery. This will be a regular accompaniment of future conventions. The exhibit was representative of the whole country, interesting architecture being shown from such widely separated states as Washington, Louisiana and Massachusetts. The buildings were largely those executed before the war and consequently well known to the profession through publication. This was only natural in view of the absence of new work till recently, and in late months there have been neither time nor draftsmen to make exhibition drawings. Future exhibitions will undoubtedly have more the character of an important national affair; the idea of inaugurating them was a happy one and they should become an event of importance in the architectural world.

The morning of the second day was devoted to

regular organization matters and the nomination of officers and the report of the Committee on Small Houses. At the last convention great interest was expressed in perfecting some method whereby the services of architects might be made available to large numbers of people who build small houses, but are unable to secure in them much character or architectural fitness because of their inability to employ an architect. A committee was appointed with Edwin H. Brown, Minneapolis, chairman, to study the subject, and this committee has arrived at a definite means of carrying out a proposal that met with the satisfaction of the convention. Briefly, the plan contemplates state organizations of architects who will subscribe to a limited amount of stock in a limited dividend paying corporation, the member architects of which agree to prepare standard small house plans and specifications that can be sold to the public at moderate cost. Any profits resulting from the enterprise will be utilized in reducing the cost of the service to the homebuilder. The first state organization is already under way, sponsored by the Minnesota chapter, and the Nebraska chapter has recorded its interest in an organization. The Minnesota organization has begun the publication of a magazine to bring its service to the attention of the public in keeping with a plan to carry out the idea along modern business lines. The eventual scheme which the convention approved is a parent organization under the control of the Institute that can render a national service; the work of publicity then will become a part of the activities of the Institute *Journal.*

A question that seems vital to the future position of the Institute is its relation to independent state societies of architects. This claimed the greater part of Thursday afternoon. The 1919 convention voted in favor of encouraging the organization of state societies and the Post-War Committee likewise recommended a similar policy, but following last year's convention such a policy has appeared to some members not compatible with the best interests of the profession or the Institute. In accordance with the instructions of the 1919 convention, delegates of the various existing state societies were invited to attend the Washington convention and there were fourteen such organizations represented. This is the first time delegates of any unaffiliated society participated in an Institute convention, and it has established a precedent that has undoubted merit.

The resolution of the convention which called for the entire matter to be reconsidered by a special committee was eminently sound, for if unification of the profession is desired, it would seem logical to weld existing organizations together, rather than encourage the establishment of new ones, irrespective of vague ideas that these newly created societies which have a tendency to thrive would eventually provide members for the Institute.

An opportunity at the end of the day to visit the Lincoln Memorial, designed by Henry Bacon and now nearly completed, injected a note of inspiration that was appreciated by the delegates after participating in lengthy discussions which seemed to emphasize for the most part the shortcomings of the profession. The wonderful scale and simple dignity of the memorial command at once the attention of the visitor. Daniel French's statue of Lincoln is yet to be unveiled and the long lagoon marking the approach to the memorial is only indicated by the steadily working steam shovels, but withal the simple magnificence of the scheme was evident to all.

The evening of Thursday covered the most fully developed result of the Post-War Committee's work — the Inter-Professional Conference — at which Robert D. Kohn presided. A vision of the work the Conference through association of the various professions can do in service to mankind was given in the remarks by Samuel T. Ansell, former acting judge advocate general of the Army, representing the law, and Dr. William G. Ebersole of Cleveland. Dr. Ebersole incidentally presented convincing illustrations that the architectural profession undervalued its services and pointed to the need of adequate remuneration for the highly skilled and competent service that the public expects to-day of professional men. It was interesting to learn that the organization of local inter-professional bodies is taking form following the recent beginning of the movement, an especially active association having been formed in Cleveland and another in process of development in New York. The formation and guidance of the movement it is pleasing to record is the work of a group of architects.

The closing day witnessed an animated discussion of a question occupying the attention of architects in the larger cities; namely, the relation of the architect to draftsmen. The discussion, which was widely participated in, was characterized chiefly by a confession on the part of the architect that he had not fully sensed the duty he owed the men working as assistants in his office. It is typical of the times that the question should arise, and it will prove of ultimate benefit to the profession that it has, because the great reservoir of future architects is the large group of draftsmen, and their usefulness to society and their representation of the profession will depend largely upon the type of training and the viewpoint of prac-

tice obtained from their contact with offices.

There are two evidences of the movement among draftsmen for a different status; they both partake of organized effort, but of widely different character. One is best described as the trade union and is supported principally by men who have no interest in becoming architects and are employed in municipal, governmental, and large engineering and architectural corporations. The other is a mutually helpful association of men interested in the advancement of the profession and themselves as individuals, who feel that through organization they can obtain better opportunities, but who appreciate the professional character of their work and have no wish to debase it. The latter type of organization is represented in New York City, and there have been a number of meetings between its representatives and a committee composed of members of the New York and Brooklyn chapters of the Institute, and architects who participated in them stated that they were helpful in bringing about a clearer understanding of the problems involved in the present management of architectural offices. Suggestions were made that some special class membership in the Institute might be created that would offer draftsmen the opportunity for association they want, but this seems impracticable for definite reasons. The interests of architects and draftsmen are not identical, and wholly frank and complete discussions of their respective problems could not always effectively be had by joint action. The result of a lengthy consideration of the problem was the recommendation of the convention that architects encourage the formation of such organizations of draftsmen that look upon their calling as a profession and not a trade, and extend to such associations their active help in providing opportunity for education in professional matters that will aid their members to acquire the necessary qualifications for satisfactory independent practice.

The architect's obligation to his draftsmen was also linked up with the discussion of architectural education, which appears with regularity on each convention program, but nevertheless remains one of the questions that seem unanswerable. A resolution was passed favoring an extension of the usual architectural school course to five years, in order to permit more time for the study of construction and office practice, which are to-day in most courses seriously curtailed. It devolves more or less to a question of the actual function of an architectural school; some would have the schools graduate highly developed draftsmen, but the more constructive and broader thinking man recognizes that the school must lay the foundation of theory in design and construction that will serve as the substantial background with which will readily combine the practical knowledge acquired in office detail. It is, therefore, incumbent on the office to recognize its obligation to the beginner; he should be given an opportunity of coming in active contact with different phases of practice as he acquires proficiency, and, in doing this, men of broader attainments will be developed and there will be less feeling on the part of draftsmen for the need of organizations to improve their conditions of employment.

The matter of competitions was not neglected; there was developed as a result of a resolution presented by the Boston chapter one of the most lively and general discussions of the three days. The Boston delegates suggested the recognition of an informal competition for smaller work in which an owner is desirous of obtaining ideas from more than one architect and is willing to pay each employed a fee, but does not want to make use of the usual competition and jury, considering that he is fitted to make his own selection of the design. The Boston plan provided that such an arrangement could be carried out with a professional adviser who would place identical information regarding the client's needs with every competing architect. The plan did not receive the necessary support, however, to be approved.

The difficulty of meeting varying local conditions by the policy of a national organization is illustrated by this example. It is generally recognized that practice varies greatly in different parts of the country, and that it is obviously impossible to apply the same principles to all and secure general satisfaction. It may not be many years before this is recognized by the Institute and the chapters given larger discretionary power in formulating principles to accord with local conditions.

The year's craftsmanship medal was presented to Samuel E. Yellin of Philadelphia for achievement in wrought iron craft.

A sequel to the recent meeting of Philadelphia architects and the local Bricklayers' Union was the presence at the convention of William J. Haggerty, member of the Union's Committee on Education, as the guest of D. Knickerbacker Boyd.

The election of officers for the year was as follows: President, Henry H. Kendall, Boston; first vice-president, Charles A. Favrot, New Orleans; second vice-president, William B. Faville, San Francisco; secretary, William Stanley Parker, Boston; treasurer, D. Everett Waid, New York. The following directors were chosen to serve three years: Charles H. Alden, Seattle; N. Max Dunning, Chicago; Abram Garfield, Cleveland; E. J. Russell, St. Louis.

Buckman Village

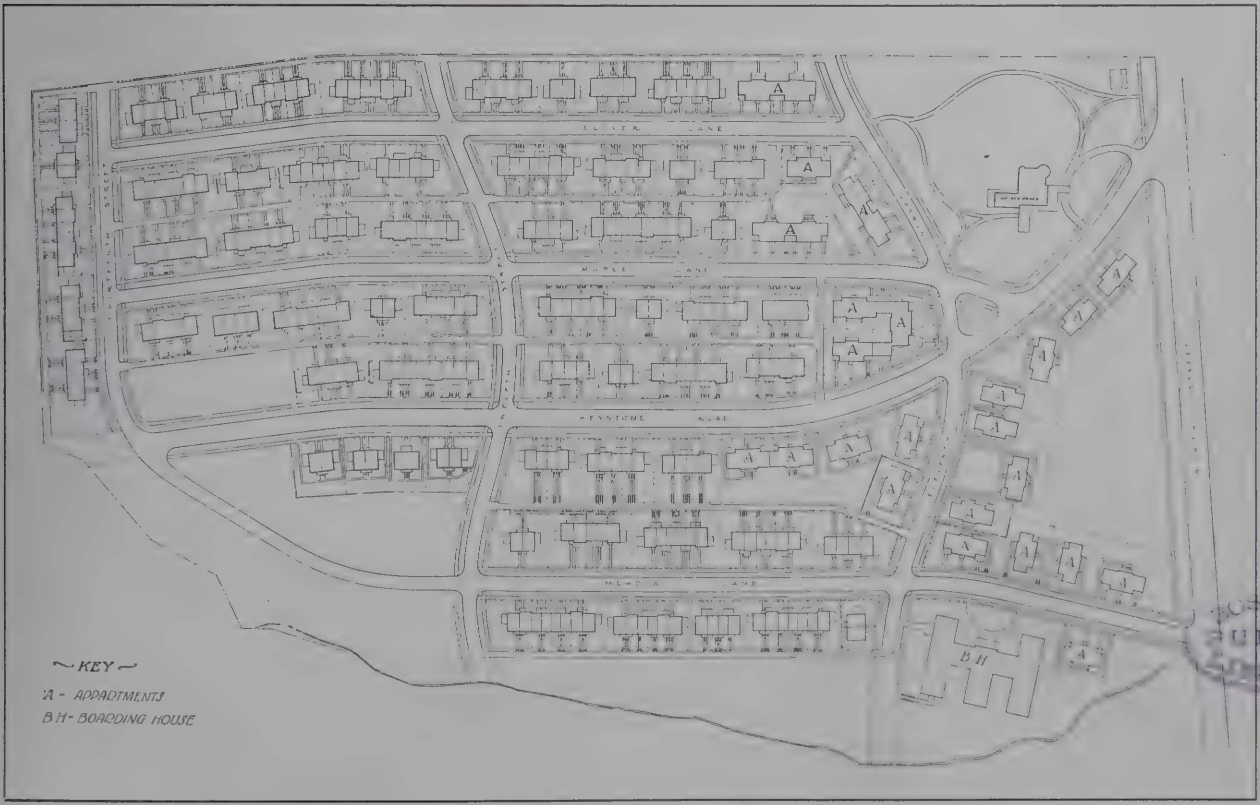
U. S. SHIPPING BOARD HOUSING DEVELOPMENT AT CHESTER, PA.

G. EDWIN BRUMBAUGH AND SIMON & BASSETT, ARCHITECTS

BUCKMAN VILLAGE is one of the housing projects of the United States Shipping Board Emergency Fleet Corporation which was substantially completed before the armistice was signed. In fact, the first prospective tenants were inspecting the village the day of the famous peace "hoax."

Because the area was limited, and the accommodations required were heavy, the plan is, of necessity, intensive. To utilize the space to the full, minimum street widths and lot divisions and group houses were adopted.

The entire village comprises a trifle over 38 acres. There are 278 houses in groups of two to eight, 106 apartments, 4 stores, Buckman Inn, accommodating 150 men in single rooms, with

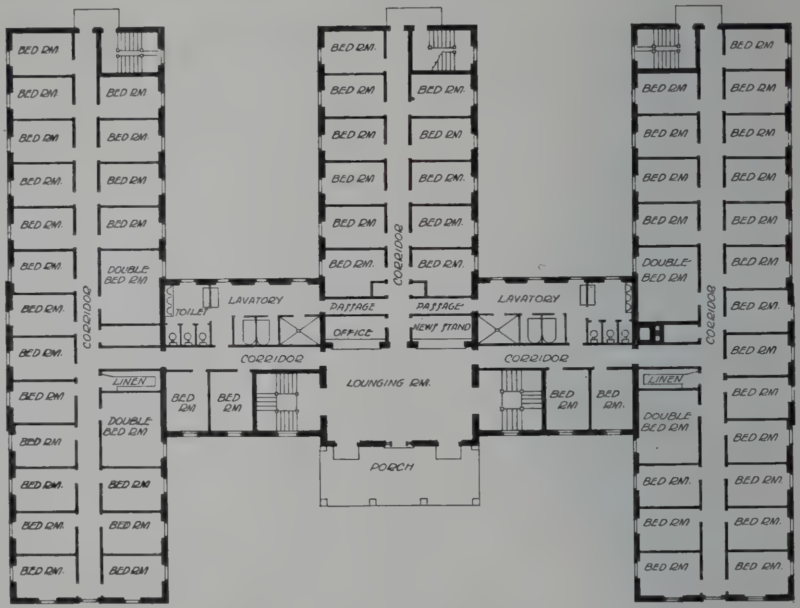


Plot Plan of Buckman Village

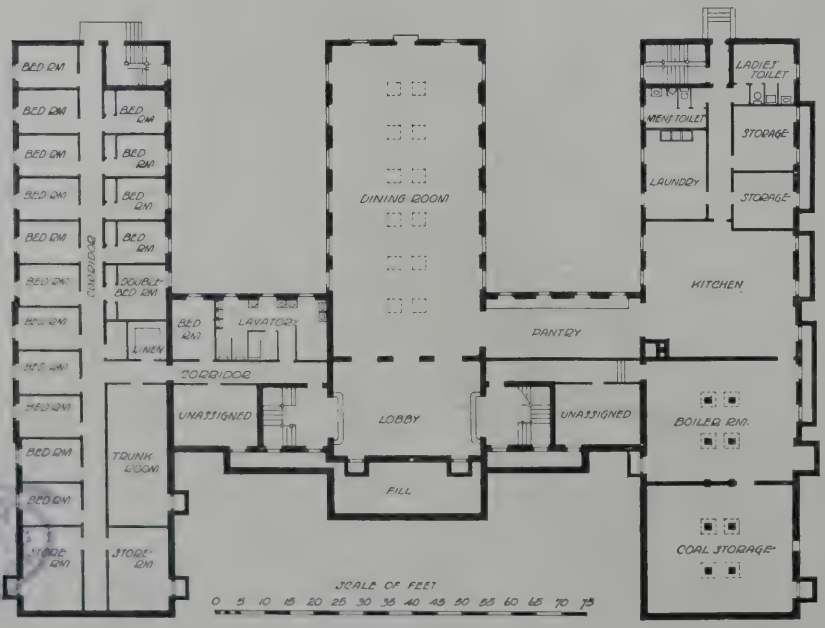
View on Thirteenth Street Showing Groups of Four and Six Houses

dining and recreation rooms, a community building (the old Buckman residence, embellished with a new shingle roof) and two parks.

Certain principles were established at the outset to govern the design. It was decided that the architecture should be uniform throughout, the scale intimate, and picturesqueness rather than formality should be the keynote. A study of the then existing housing developments in America forced the conclusion that community consciousness is but faintly developed, and uniform community care is almost unknown. As nothing is more pitiful than shabby formality or symmetry struggling to express itself against the terrible odds of varicolored window shades, conflicting tints in painted woodwork and individual ideas about landscape architecture, everything approaching formal treatment was carefully avoided.



Second Floor Plan of Boarding House



First Floor Plan of Boarding House

The delightful old farm and village groups which have survived from the days of the colonies in every eastern community furnished the style. Rambling, picturesque, and of necessity, simple in detail, they have withstood neglect and changing "styles," and alone, of all our architecture, are beautiful in their decay.

The plan of the village is very simple, and was dictated largely

Houses at the Corner of Maple Lane and Eleventh Street Containing Four Flats Each

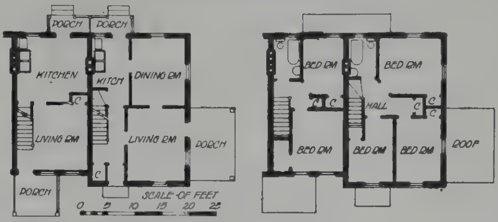
by the topography. Keystone road, the "main street," runs along the natural crest of a broad plateau, from which the ground slopes rapidly to the bed of a small stream. Meadow lane parallels Keystone road at the lower level, and the other streets are all arranged to provide natural circulation, economical blocks and connection to existing Chester streets. Keystone road, when extended a short distance beyond the village, will join the end of a township road of the same name. Two splendid groves of trees at opposite ends of the village were carefully preserved as parks, and a small open square or "commons" was established at an intersection of streets near the trolley station. Fronting on this commons is the group containing the village stores.

In the design of the houses a unit system was evolved, in which two houses were considered as an "end unit," and by effecting various combinations of comparatively few units, variety was easily obtained. Unsymmetrical groups were designed and scattered along all the streets, in an effort to simulate a more slowly developed community. The houses were not lined up, but were placed at varying distances from the front property line, so that everywhere the prospect is varied. All materials consistent with the underlying Colonial style were used. There are brick houses, stucco houses, brick and clapboard, and stucco and clapboard, and it is surprising how totally different the same group looks in a different combination of materials. The uniform use of

View Down Eleventh Street Showing Boarding House at Extreme Right

First and Second Floor Plans of Typical Four-Flat Houses

First and Second Floor Plans



First and Second Floor Plans

Typical Terminal Units of Two Single Houses

black Pennsylvania slate (the Government would not allow green Vermont slate because of the shortage of freight cars) did not prove to be the calamity anticipated, and really provides a rather pleasing architectural "tie" throughout the village.

A serious effort was made to avoid the alleys which group houses seem to demand. The attempt was finally abandoned, because none of the solutions devised could be reconciled with the typically American desire to live "on a front street." Attention was then directed toward making the alleys as inoffensive as possible. The chimneys, enlarged by the addition of ventilating flues, help to make the rear elevations interesting.

The apartments were planned in groups of four, to give maximum light and air, and because apartment dwellers are apt to be convenience seekers, the apartments were all grouped about the entrance to the village, near the stores and trolley line.

Buckman Inn was placed on Meadow lane so the Inn "boarders" will use a different trolley stop from the rest of the villagers.

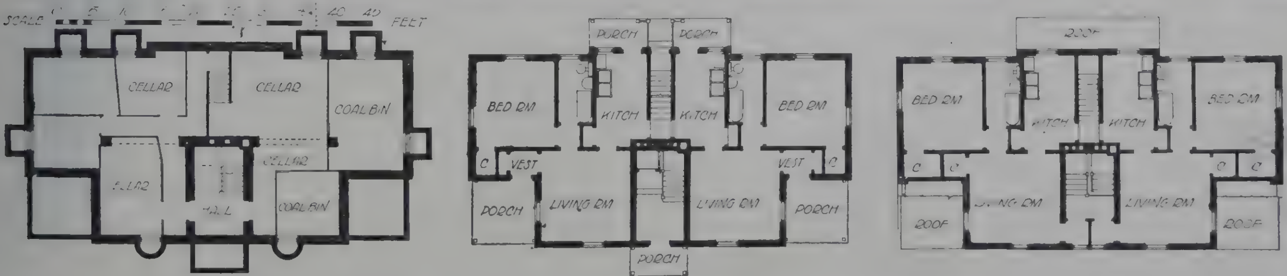
Many things were learned which it is not the province of a short description to dwell upon; but perhaps most important of all the lessons was the vindication of the age-old principle that simple materials structurally used are better than fine materials falsely used.

It is to be hoped that Buckman Village may add to the steadily accumulating proof that small two-story houses need not be monotonous or ugly because they are in rows.

It may not be too much to hope that it will influence the eventual abandonment of the row house altogether in favor of the group house of many units as its logical successor.

Two-Family House at the Corner of Meadow Lane and Eleventh Street

STORES AND APARTMENTS AT THE JUNCTION OF KEYSTONE ROAD AND MAPLE LANE



BASEMENT, FIRST AND SECOND FLOOR PLANS AND VIEW OF FOUR-FAMILY HOUSE OF ONE TYPE

HOUSING DEVELOPMENT, BUCKMAN VILLAGE, CHESTER, PA.

VIEW ON KEYSTONE ROAD TOWARD TWELFTH STREET

SINGLE FAMILY GROUP HOUSES ON MEADOW LANE

VIEW IN THE DIRECTION OF ELEVENTH STREET FROM THE OLD BUCKMAN HOUSE

HOUSING DEVELOPMENT, BUCKMAN VILLAGE, CHESTER, PA.
G. EDWIN BRUMBAUGH AND SIMMON & BASSETT, ARCHITECTS

Interior Decoration

SOME DOMESTIC INTERIORS FROM THE WORK OF HOWARD MAJOR

By HELEN CHURCHILL CANDEE

ONE dominant, actuating thought runs through each work of Howard Major's, and thus he arrives at fitness and consistency, which are the foundation stones of beauty. The situation of the house determines what manner of house it shall be, into which general class it shall fall — country house, urban or suburban. Beginning thus, the utmost consistency is maintained in the structure, in the interior finishing, and finally in the decoration and furniture.

The public is well educated to the belief that only an architect can design a house with an exterior which is pleasing and distinguished, but it is taking far longer to impress the idea that a tyro makes only utter failure in assembling the arts that make up the perfect interior. It is but natural. The household gods have tendrils that clasp the human heart as the ivy vine clasps stone walls. "*Je meure où je m'attache,*" says the ivy, and so says many a set of furniture, of curtains, of mantel ornaments that the home maker is firm about retaining. And thus comes a terrible hodge-podge of things loved for association's sake. Of all domestic mistakes never was a greater than this, to continue to live amongst things of bad taste because once one knew no better.

There is, however, an even more subtle preventive to tasteful interiors on the part of the public. It is the belief, latent in most women, that they have a gift for decoration. This one fallacy does more to retard taste in the home than any other, for it leads clients to stop professional work at the newly finished front door.

It is true that many a woman has a knack of assembling and contrasting colors, of catching or forecasting a clever though ephemeral mode, and of creating an effect that abounds with femininity and fashion. But the effect has so little lasting value that in a year or two, when it has lost its youth, it seems not what it was. The mellowing of time is but the withering of the rose on work such as this.

There is a subtle matter called good taste which is partly a natural gift, but which depends mainly on knowledge accumulated slowly and with an enthusiasm that never flags. Every architect is

Dining Room in the House of W. J. Grant, Esq., Pelham, N. Y.

not thus fitted for interior work, but to this art Mr. Major has given happy attention. He has a feeling for interiors that amounts to an instinct. He makes them correspond to the exterior, a necessity which many disregard. It is with somewhat of a shock that one meets anachronisms in houses, as in one example where a wild-wood, one of America's enchanting tangles, leads to a fifteenth century Italian convent in stucco, with arched pergola and tiled floors, which in turn opens into rooms fitted entirely with furniture of Sheraton and prints of Japan.

In Mr. Major's work exteriors indicate what is to be found inside, and the finish of his rooms is planned from the start. But his work does not stop in giving a definite note to the room; he keeps a guiding hand on its furnishing until a harmonious ensemble is completed and the room makes the perfect setting wherein the human drama may be happily played.

Not so easy this, because of three interferences: the unformed taste of the client, the clinging to hopeless old furniture, and the ever-increasing difficulty of finding fine old pieces which shall dominate the room and declare its taste and distinction. A study of the examples given of Howard Major's interiors shows how successfully he meets obstacles.

His work has a certain buoyancy coupled with decision. While taking suggestions from the past he uses them in a way that is modern and original without injuring their beauty. It is noticeable that he likes to play with motifs of the more neglected old styles, the quaintness of the early nineteenth century. This is a fertile field in the hands of the enthusiast and one which is little understood.

There is, for example, the time of the First Consul. Exquisite restraint, delicate classicism are its chief characteristics as a style. It has a distinction, a patrician conservatism of great charm. Its relation to *le style Empire* is like that of the Primitives to artists of the Renaissance. A look at the doorway illustrated shows Mr. Major's way of using it in a formal corridor, and the detail of the dining room in the Beard house shows with what elegance a mantel may be emphasized and decorated with pilasters having beautiful capitals.

Somewhat of daring is his in reviving a certain old fashion, that of marbleizing; daring because there are those who remember, in certain Victorian houses, the 1860 revival of that very matter, atrociously done in paper of high glaze. But such memories are ghosts of a somber past, bearing no relation to Mr. Major's revival except to emphasize the gay hardihood with which he masters a matter on which others have failed.

The present marble painting has a quality which real marble lacks, a softness and a lack of chill, Mr. Major says of it, and by means of special processes he gains these effects. The skilled workman of true artistic feeling is a *sine qua non* of the process. But it is with results that we are concerned, and it must be said that these are indeed happy. The quaint dignity of other days abides in the room thus treated.


Dining Room Detail in the Frankel House, Brooklyn, N. Y.

In the dining room mentioned, the marbling covers all the walls in warm light tones. A base, chair-high, is formed of the two, black veined with color, and a light mixture like one of the Italian marbles. Were a dining room thus lined with real and glistening marble it were a chillsome place for hospitality. This was known to the decorators of the Directory, and hence they sought the dignity, the classicism

DETAIL OF LIVING ROOM

MANTEL IN DINING ROOM

HOUSE OF WILLIAM BEARD, ESQ., WASHINGTON, D. C.
HOWARD MAJOR, ARCHITECT

and the color of marble, but found a way to destroy its hardness and its chill by marbling the wood.

It is, however, desirable that floors should be hard, both in appearance and in reality, and Howard Major never hesitates to lay them in the old style of large checker-squares of alternating black and white. Could anything be more elegant or more highly appropriate for the modern dwelling where white woodwork abounds? A study of the hall in the house of Hugh Legaré, in Washington, shows it in clever use. Here it gives warmth, decorative balance and elegance. With white as the color for wood-trim, walls, ceiling and stairs, this display of heavy shading is a necessity cleverly met. It gives solidity to the ensemble. Also it takes the place of rugs, which the climate of Washington banishes for most of the year.

A play of alternation makes interesting this same hall, the employment of interchanging curve and angle in the openings, as for instance the generous rounded arch of the passage in juxtaposition to the square-topped doors. This same play is seen elsewhere in his work, notably when fitting a colonial room with arched doors to make a composition with the mantel, to fill the entire end of a room in which other doors and windows are rectangular. That it is done with harmonious effect proves an able pencil.


Doorway in the Frankel House, Brooklyn, N. Y.


Overmantel in the House of Hugh Legaré

The use of the arch as a corrective to too much angularity is a frequent resort in other ways; for example, there is the return to that graceful repository, the niche. It is made the central motif to the overmantel, where it offers hospitality and protection to some cherished work of art, a large group of Saxe, a Claudian marble, or a tall, serene Kwan-Yin with curving draperies of *blanc de Chine*, those draperies too often victimized when abiding in a less protected haven. Not only over the mantel does the niche throw its arch, but on either side of it, or on either side of the door in an entrance hall, as was done in the eighteenth century, and never does it fail to lend grace and interest in contrast to the straight lines usual in all rooms. It is remarkable that more architects have not revived this delightful expedient. Possibly, in these days of sham, our walls are made too thin to permit the hollowing out.

The value of the doorway as a decoration is not forgotten in Mr. Major's work. He regards these necessary openings as fields whereon a designer

DETAILS OF ENTRANCE HALL AND DINING ROOM, HOUSE OF HUGH LEGARÉ, ESQ., WASHINGTON, D. C.
HOWARD MAJOR, ARCHITECT

may play with all his erudition and some of the quality of imagination. Versatility declares itself in the illustrations given. In the dining room of Mr. W. T. Grant, at Pelham, the doors are delightfully accented with the simpler form of the broken pediment, that decoration so dear to the serious instincts of Christopher Wren. Width of openings is a necessity to the proportions — and who does not love a wide door with a suggestion of spaciousness?

In a grander manner the broken pediment throws its severed arch across the top of the door in the dining room of the Legaré house. Old houses of London come to mind, and manor houses set in umbrageous parks in stage-coach days, also the talent of Wren, which the devastation of 1666 forced into a prolific flowering. Heavy shadows and high lights come by reason of moulded members, egg and dart, the bound wreath, all familiar but all reassembled for modern use. Beadings and acanthus tips follow the lines to the floor, but, with apt restraint, the door itself and the wall panels as well, are left without ornament.

Mr. Major has gone to the early years of the nineteenth century for the door of the Frankel house. Its lines and proportions show the simplicity which comes only with study and ability. The door frame surrounds the door in unbroken design, but originality and elegance are achieved by the over-door. This smacks of the doctrine of elimination and of chastity in art which prevailed in France under the First Consul, and which found its English expression under the Brothers Adam.

A row of alternated urns is placed between triple uprights, the whole capped by a heavy moulding with reveals extending beyond the door panels. Nothing could be simpler, yet nothing more refined and eloquent of taste. Mention has already been made of the arched door piquantly placed with square openings, but these are often fitted with a carved keystone after the ancient manner, a certain happy reminiscence.

It goes without saying that Howard Major gives study to his mantels. Where possible, he uses them as the center of a decorative scheme which occupies all one wall. On either side he places pilasters, as in the dining room of the Beard house. In this case the pilasters are repeated in the corners of the room, which, with the dado, make panels of the wall space. The living room of the same house being finished in wood paneling, the mantel falls naturally between the panels, the curving corners adding a touch of interest. With fine intent the mantel of the Legaré house is true to type, without shelf and fitted above with highly decorative carved garlands; but in this the effect is hurt by the proportions and by failure to catch just the right spirit in the carvings, so that one feels an incongruous mixing of flavors, a meeting of two differing talents, as though Grinling Gibbons were shaking hands with the carvers of Louis XVI, and neither in accord with Wren, who stiffens the background. Perhaps this criticism shows an exaggeration of values, but of perfection in little things is made the quality of good taste.

One more charming feature must be mentioned. It is the introduction, wherever possible, of bookcases which form a part of the scheme of the room. They are set in the walls so that the backs of the books on the shelves are flush with the panels framing them. This savors of the elegant fashion in *boiserie* under Louis XV, yet is executed with a simplicity which makes its appeal to the practical. The bookshelves may fill the spaces on either side a mantel-breast, flush with that section, or they may fill an entire side of the room. And even those to whom books mean only bindings acknowledge the fine decorative quality of well-filled bookshelves.

This brief review must show that an admirable instinct for making of an empty room a finished architectural problem appears in all Mr. Major's work. This simple statement proves his talent as a decorator as well as an architect. It is the fault of many an architect that he leaves the interior blank, characterless. It is then the province of the owner to make it what he likes, without the co-operation of the man who planned it and who knows better than any others with what it should be decorated. An architect has but half finished if he has not completed each room, wall by wall. To this he should add suggestions as to the kind of furniture and hangings the completed room might have. If a professional decorator is given the work, then for his own sake the architect should establish friendliness with this new element and introduce suggestions through this medium.

Rivalry between architect and decorator is untenable. Both are working for the same end, and co-operation displaces rivalry. It is undeniable that the architect has usually had a more profound study in design than the usual decorator, therefore he is in a position to avoid certain errors in assembling in rooms where miscellany prevails and to avoid errors in style where a style is determined. The decorator, on the other hand, is one who knows better the market for fabrics, the choice of colors, the fashion in carpets, the price of furniture, and a thousand details that express taste and try the patience. Therefore the result is happy when architects like him whose name heads this article finish artistically the interior of the human dwelling and carry their interest so far as to co-operate with the decorator.

DETAIL OF ENTRANCE

HOUSE OF A. K. WAMPOLE, ESQ., GUILFORD, MD.

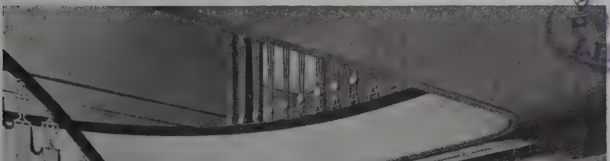
MOTT B SCHMIDT ARCHITECT

VIEW OF MAIN FRONT

HOUSE OF A. K. WAMPOLE, ESQ., GUILFORD, MD.

MOTT B. SCHMIDT, ARCHITECT

VIEW FROM GARDEN



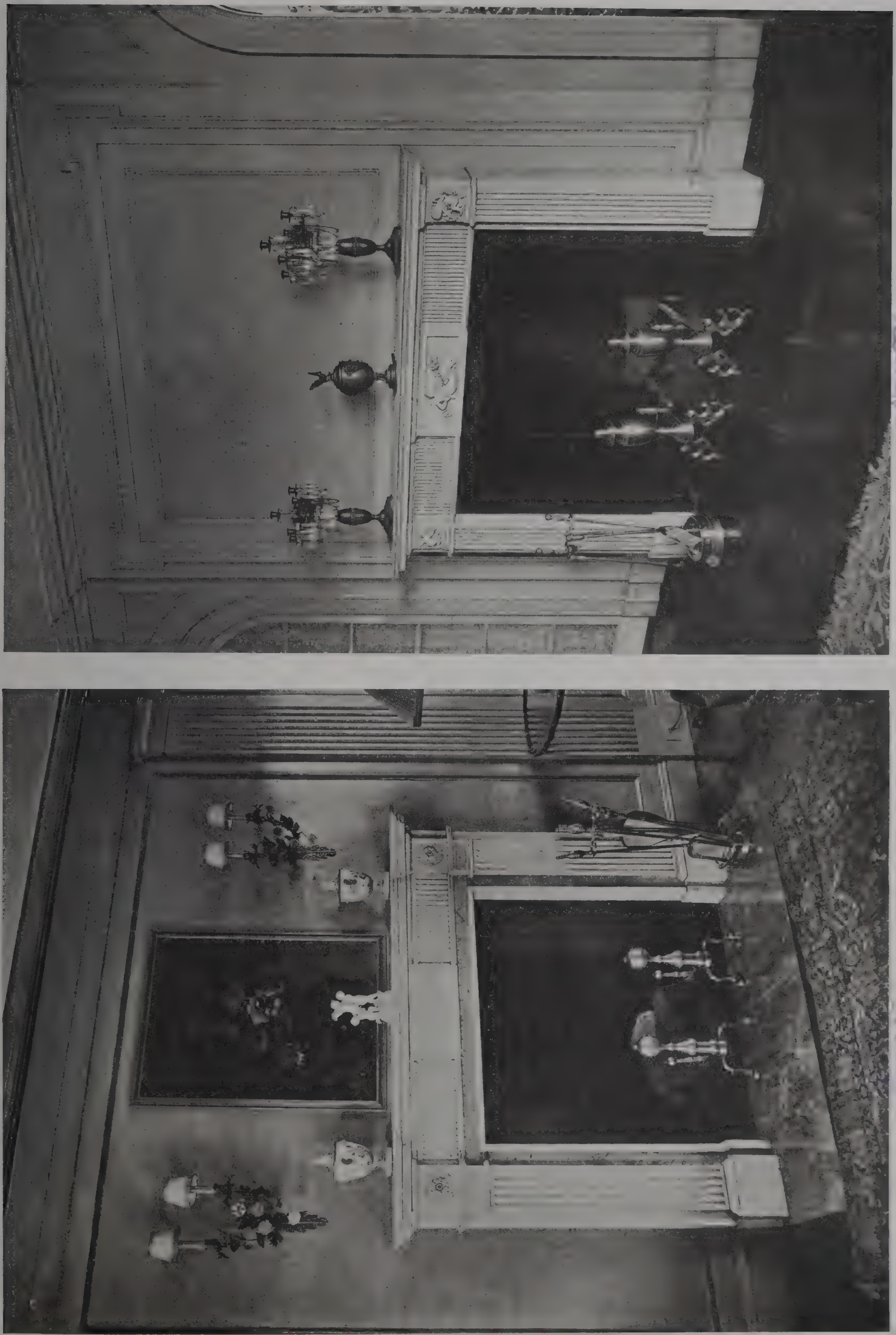
DETAIL OF STAIRWAY

SECOND FLOOR PLAN

FIRST FLOOR PLAN

HOUSE OF A. K WAMPOLE, ESQ., GUILFORD, MD.

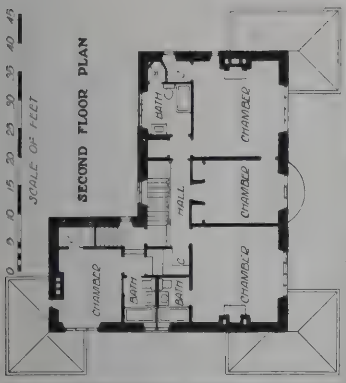
MOTT B SCHMIDT, ARCHITECT

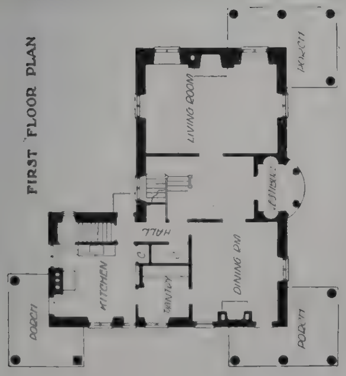


LIVING ROOM AND DINING ROOM MANTELS

HOUSE OF A. K. WAMPOLE, ESQ., GUILFORD, MD.

MOTT B. SCHMIDT, ARCHITECT





GENERAL VIEW

HOUSE OF DAVID W. MILLER, ESQ., EDGEWORTH, PA.

HENRY D. GILCHRIST, ARCHITECT

DETAIL OF PORCH AND ENTRANCE DOORWAY

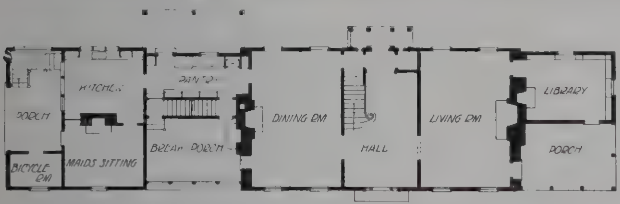
HOUSE OF DAVID W MILLER, ESQ., EDGEWORTH, PA.

HENRY D. GILCHRIST, ARCHITECT

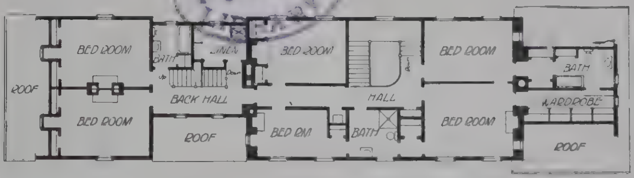
VIEW OF MAIN FRONT

HOUSE OF ROYAL S. GOLDSBURY, ESQ., EDGEWORTH, PA.

INGHAM & BOYD, ARCHITECTS



FIRST FLOOR PLAN



SECOND FLOOR PLAN

VIEWS FROM GARDEN LAWN

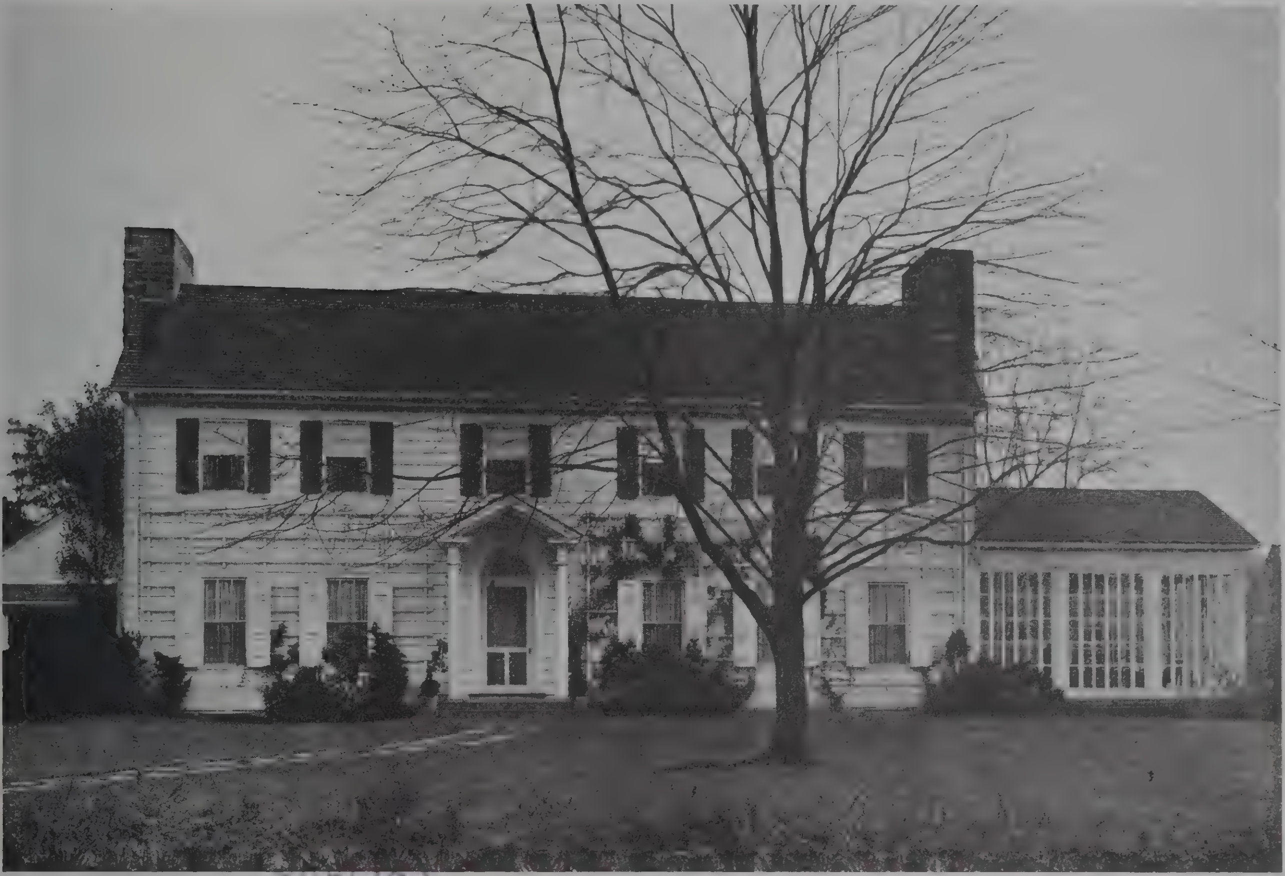
HOUSE OF ROYAL S GOLDSBURY, ESQ., EDGEWORTH, PA

INGHAM & BOYD, ARCHITECTS

DETAIL OF ENTRANCE DOORWAY

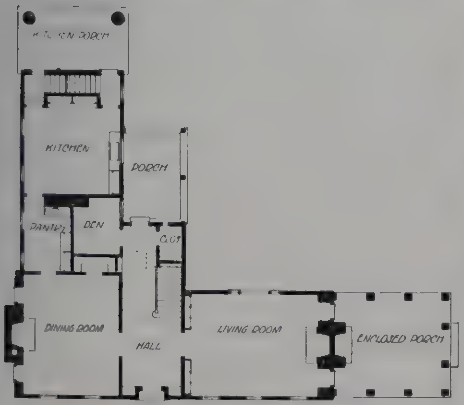
HOUSE OF MRS. FITCH, EDGEWORTH, PA.

INGHAM & BOYD, ARCHITECTS



GENERAL VIEW

SECOND FLOOR PLAN



FIRST FLOOR PLAN

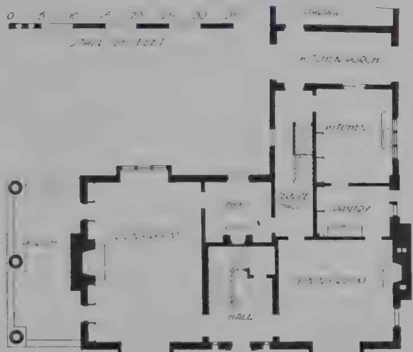
VIEW TOWARD LIVING PORCH

HOUSE OF MRS. FITCH, EDGEWORTH, PA.

INGHAM & BOYD, ARCHITECTS

VIEW OF ENTRANCE FRONT

VIEW TOWARD SERVICE WING

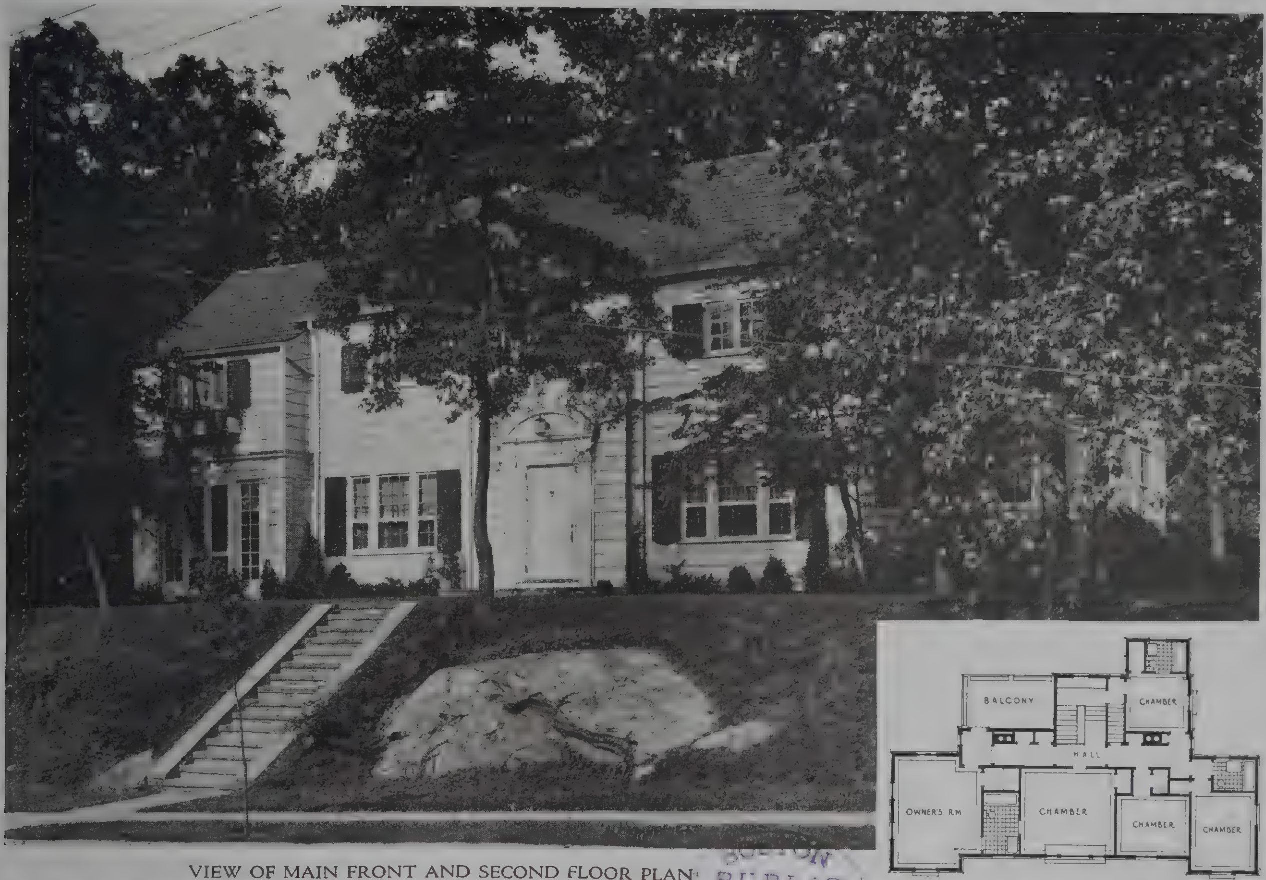


FIRST FLOOR PLAN

SECOND FLOOR PLAN

HOUSE OF CLARKE PAINTER, ESQ., EDGEWORTH, PA.

INGHAM & BOYD, ARCHITECTS

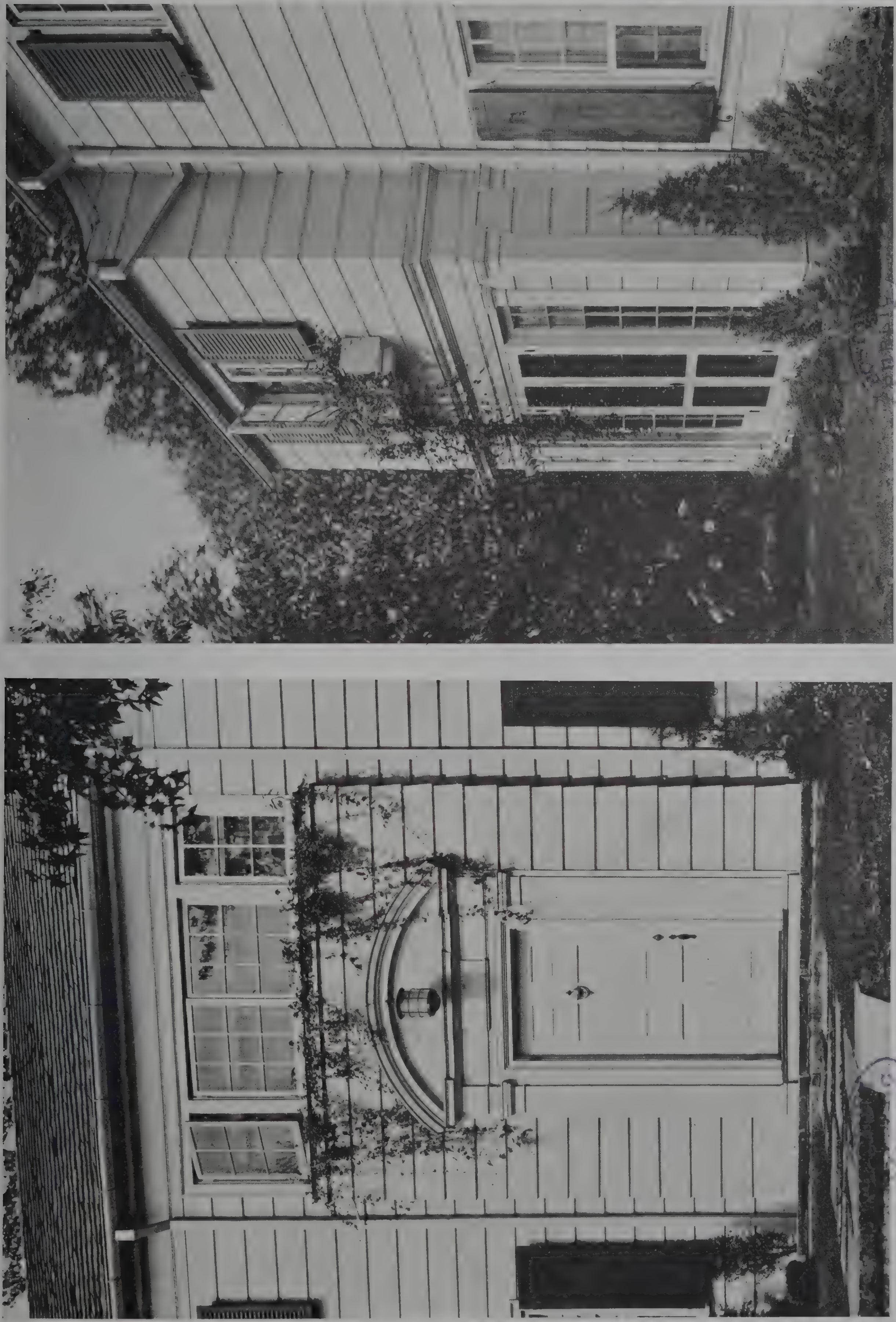


VIEW OF MAIN FRONT AND SECOND FLOOR PLAN

FIRST FLOOR PLAN AND VIEW AT REAR OF LIVING ROOM END

HOUSE OF JOSEPH E. BUSH, ESQ., FIELDSTON, N. Y

DWIGHT JAMES BAUM, ARCHITECT



DETAIL OF PORCH FRONT AND ENTRANCE DOORWAY

HOUSE OF JOSEPH E. BUSH, ESQ., FIELDSTON, N. Y.

DWIGHT JAMES BAUM, ARCHITECT

GENERAL VIEW

HOUSE AT RIVERDALE-ON-HUDSON, N Y

DWIGHT JAMES BAUM, ARCHITECT AND OWNER

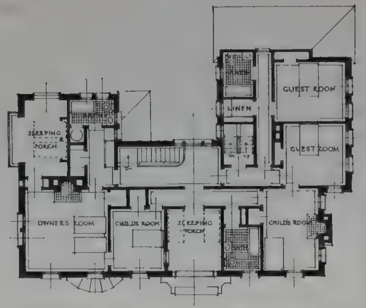
VIEW OF STUDY ENTRANCE AND SERVICE WING

ENTRANCE HALL

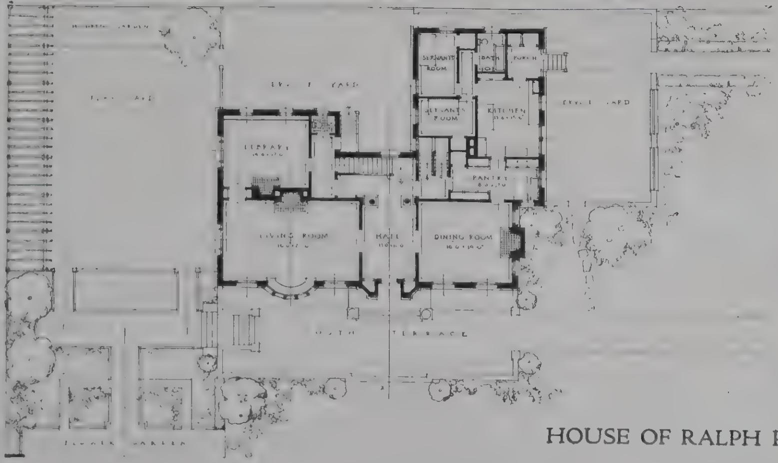
HOUSE AT RIVERDALE-ON-HUDSON, N. Y

DWIGHT JAMES BAUM, ARCHITECT AND OWNER

DETAIL OF SOUTH TERRACE



VIEW OF ENTRANCE FRONT



HOUSE OF RALPH P. MERRITT, ESQ., BERKELEY, CALIF.

WILLIAM C. HAYS, ARCHITECT

Some Interesting Country House Alterations

By LEWIS E. WELSH

The F. P. King House before Alterations

IT IS a curious fact that the type of work most disliked by architects should, at the present time, be the work which is in peculiar demand by clients and is most easily done under the present stringent conditions in the building industry. Due to the prevailing high prices and scarcity of labor and materials, the alteration of old buildings has developed surprisingly and holds many possibilities.

A few years back it was supposed, and probably correctly, that the average old building had little or no value, and that it was cheaper to tear down and start over again than to make alterations. This idea was shared not only by architects and builders but by the owners themselves, and most architects were only too glad to advise their clients to follow that course. In this way much of the original Colonial work of lesser size, but nevertheless of distinct architectural beauty and material value, was ruthlessly destroyed. It is, perhaps, unfair to say that the architectural profession was responsible for this, but it does seem as though with a little more foresight and study a large percentage of this loss could have been prevented. The value of these old masterpieces of architecture is easily seen, and their restoration and revitalization is not a difficult architectural problem, but is more often a study in archeology.

The real laurels are for the man who is able to see the latent possibilities of the Victorian buildings, and who can reform and bring back into the fold these notorious prodigals.

The glaring faults of the Victorian houses are only equaled by the temerity of the architects in selecting styles of which they had so little knowl-

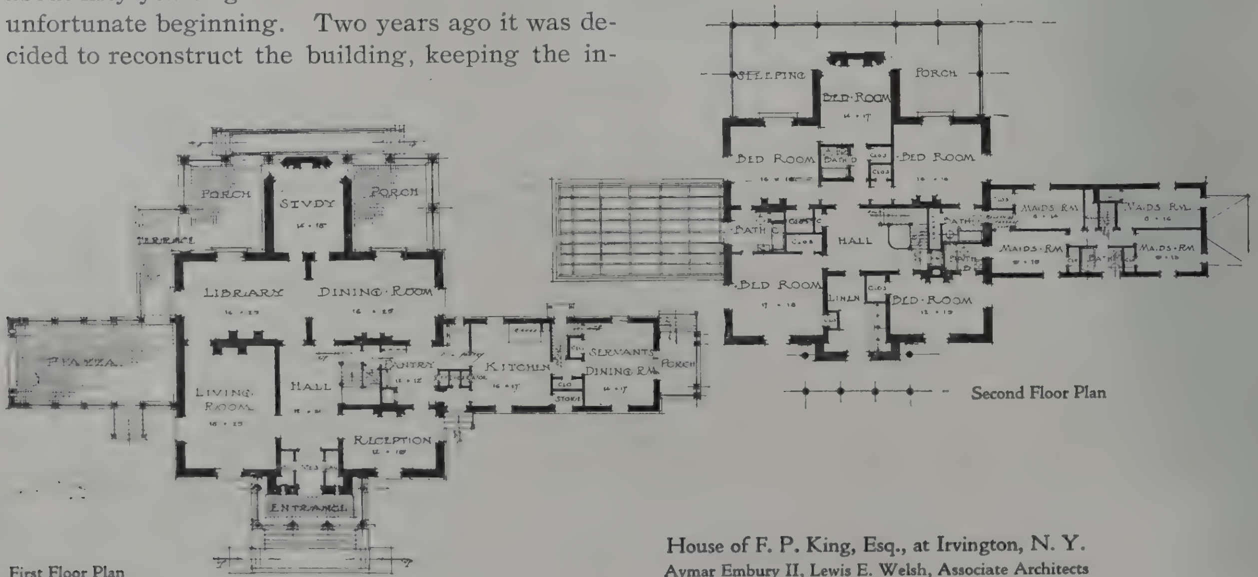
House of F. P. King, Esq., at Irvington, N. Y., after Remodeling

Aymar Embury II, Lewis E. Welsh, Associate Architects

Detail on Piazza Wing of the King House

edge. For example, we find them applying the Swiss chalet type to the large house of a country estate. It is apparent that the effect of this is to neutralize the natural charm of the Swiss style and dwarf the stately proportions of the building, the result being an insignificant and decidedly commonplace piece of architecture. The residence of Mrs. F. P. King at Irvington, N. Y., was built about fifty years ago and had the above mentioned unfortunate beginning. Two years ago it was decided to reconstruct the building, keeping the interior arrangements very nearly intact. Present day needs demanded new service quarters, which could not very well be placed in the main house, so a service wing seemed essential. As it was impossible to build this wing in the same style as the house, it was decided to change the exterior of the whole building. The house was so covered with jig saw projections, brackets, balconies and porches that there was nothing about it which suggested a dignified and appropriate style. Upon closer inspection it was found, however, that the house had well balanced proportions and simple lines entirely hidden from casual view by the badly designed details. It was decided to tear off the roof and carry up the end walls, putting on a gambrel roof in order to get additional rooms in the third story. All this work was done without cutting the masonry walls.

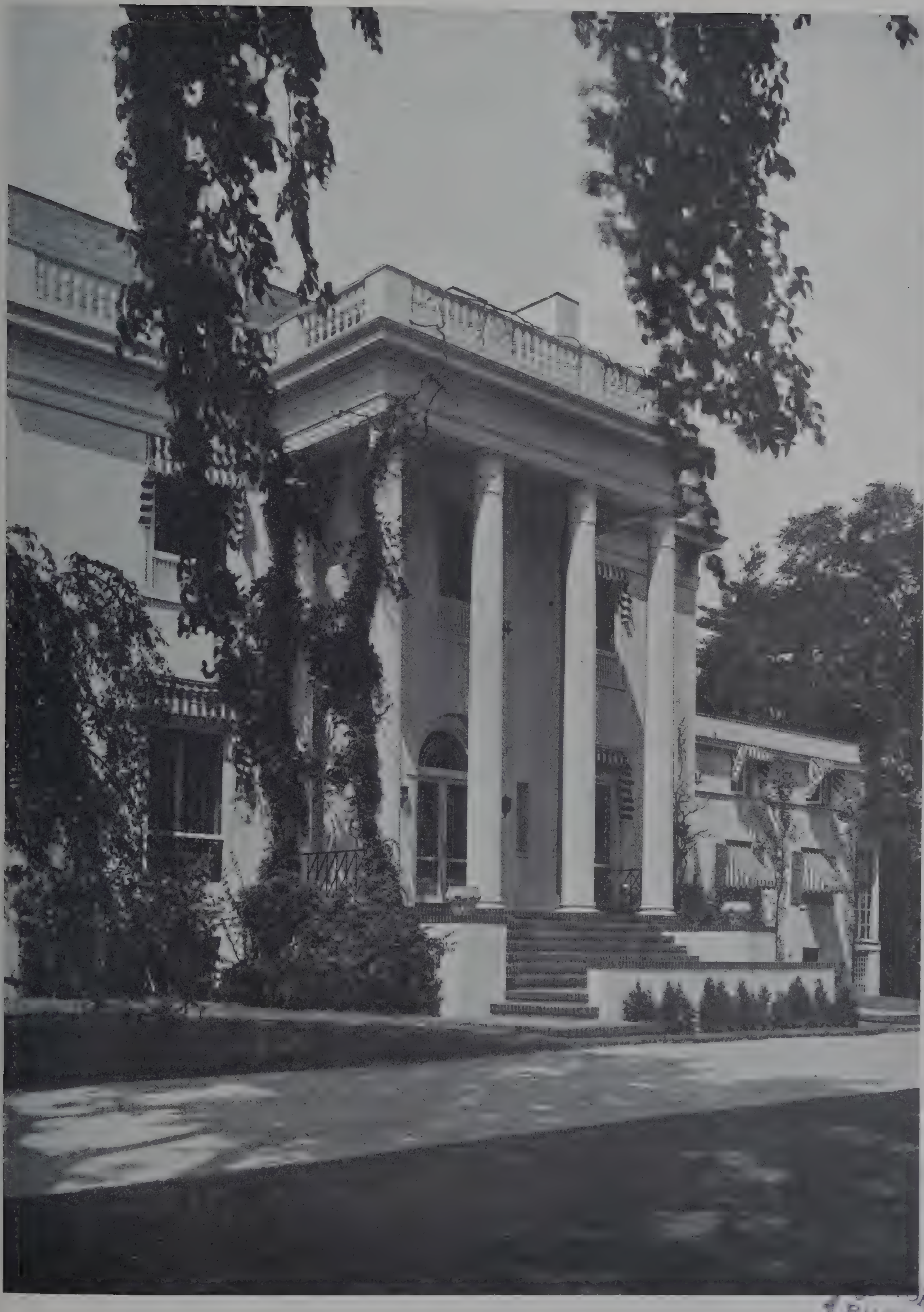
On the entrance side and on the river side there are projections which have been masked by a column treatment. The river side projection divided the porches and these were carried far enough to enclose the entire projection. The original house was covered with old and valuable wistaria vines, which were carefully removed from the house and supported during construction on heavy poles set for the purpose. This was neither an expensive operation nor a difficult one, but the value to the reconstructed building cannot be overestimated.



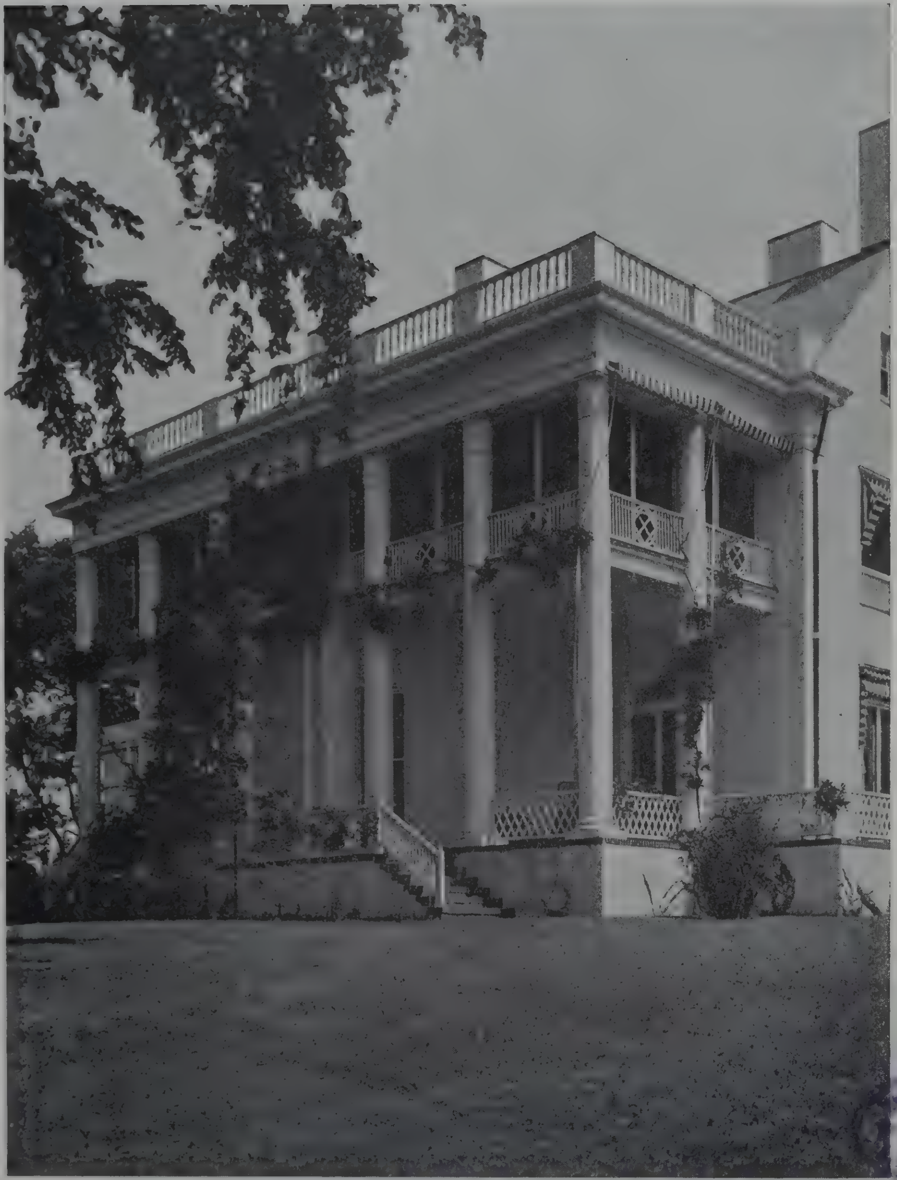
Second Floor Plan

First Floor Plan

House of F. P. King, Esq., at Irvington, N. Y.
Aymar Embury II, Lewis E. Welsh, Associate Architects



DETAILS OF ENTRANCE PORTICO, HOUSE OF F. P. KING, ESQ., IRVINGTON, N. Y.
AYMAR EMBURY II, LEWIS E. WELSH, ASSOCIATE ARCHITECTS



DETAIL OF REAR PIAZZA

DETAIL OF NEW PIAZZA WING

HOUSE OF F. P. KING, ESQ., IRVINGTON, N. Y.   AYMAR EMBURY II, LEWIS E. WELSH, ASSOCIATE ARCHITECTS

House of Harry Michaels, Esq., before and after Remodeling. Alfred Busselle, Architect

Entrance Detail of the Remodeled Snyder House

A very different problem was presented by the house of Mr. Harry Michaels, near Ossining, N. Y., remodeled by Alfred Busselle. The house was built by Dutch settlers and had considerable charm in mass and detail, but was too small for practical purposes. Almost no alterations had been made to the exterior, except the addition of two very bad dormers. As in most of the Dutch houses, the second story was of little value, but the addition of a long dormer, usually so hideous, turns an attic into perfectly usable rooms. This dormer has been so cleverly handled, by keeping the roof projection small and by staining the vertical shingle surfaces the same as the roof, that we hardly realize its presence. By comparing the "before and after" photographs of this house it will be seen that the new rear wing, while fully as large as the house, has been suppressed as much as possible in order to emphasize the old portion. The addition of the sleeping porch only slightly above grade on the hill side of the house forms a splendid connection between old and new work. It is always well when joining up with old work to cover the connection with a projection at right angles or by changing the plan of the elevation. Changes in scale as well as material or construction are often overcome in this way. The simple arbor

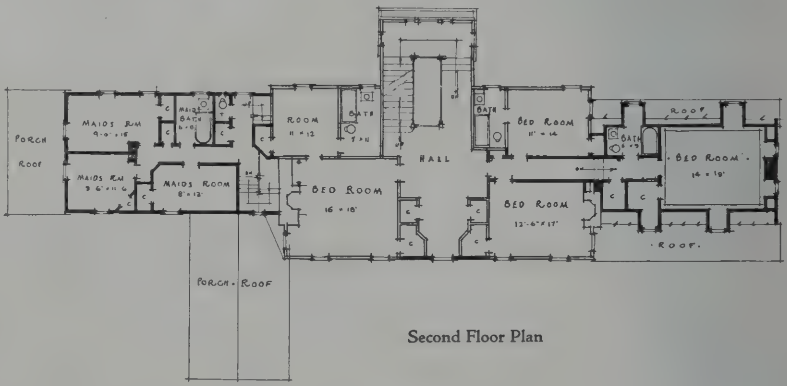
Views of the Snyder House before Remodeling

Study Entrance and Plans, House of Louis Snyder, Esq., Rye, N. Y.

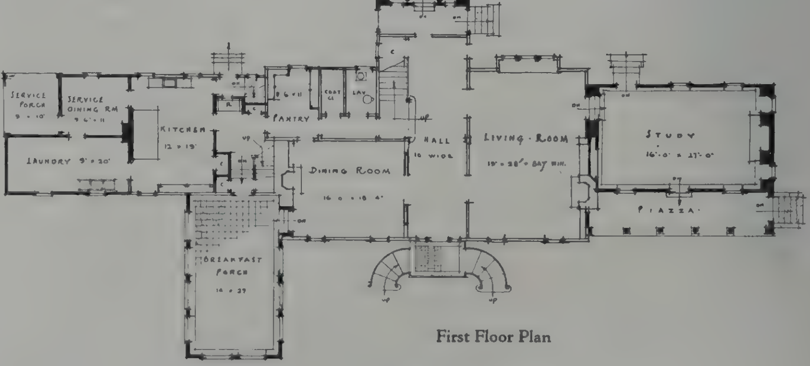
of the Michaels house is a successful attempt to widen the existing narrow porch and again shows the care which Mr. Busselle has used in preserving the original roof lines.

It seems strange that architects should be called upon to remodel houses only twenty years old, when we take into consideration that twenty years is hardly a fifth of the lifetime of the average house. Surely our standards of taste and design change quickly to require alterations almost at the beginning of the life of a building. The Louis J. Snyder house at Rye, N. Y., while it had not fallen into bad repair, was a typical example of the pseudo-Colonial of 1900, when to build a Colonial house all that was necessary was unpainted shingles and white trim. Few of these houses were simply built and in most cases the effects of the Victorian styles are still found. In the Snyder house more space was required for sleeping rooms, so a wing was decided upon, and, as the house was located on a knoll, it seemed best to make this addition at a lower level, thereby following the contours of the ground. The wisdom of this course can be seen in the photograph, as the stilted appearance is almost entirely overcome. The dormers on the original house presented an interesting problem, as there has been no change made to the structure or roof lines, the entire change being in the exterior trim and cornice, which are new. The plaster on the interior was not disturbed during the progress of the work. Most of the exterior changes were made necessary by the tearing off of badly orientated porches.

The success or failure of alterations is dependent almost entirely upon the architect's ability to see value or possibilities in existing buildings. Even the much despised Army buildings are coming in for a new use. One architect has been asked to take one of the buildings and attach it to a clubhouse in New Jersey, and the result seems to be as successful architecturally as it is financially. Surely there are no buildings which cannot be redeemed if these uninteresting examples of hasty construction can be improved.



Second Floor Plan



First Floor Plan

Aymar Embury II, Lewis E. Welsh, Associate Architects

TWO VIEWS FROM THE GARDEN LAWN

REMODELED HOUSE OF LOUIS SNYDER, ESQ., RYE, N. Y.

AYMAR EMBURY II, LEWIS E. WELSH, ASSOCIATE ARCHITECTS

VIEW OF ENTRANCE FRONT

NEW STUDY WING FROM GARDEN SIDE

REMODELED HOUSE OF LOUIS SNYDER, ESQ., RYE, N. Y.

AYMAR EMBURY II, LEWIS E. WELSH, ASSOCIATE ARCHITECTS

ARCHITECTURAL & BUILDING ECONOMICS DEPARTMENT

C. STANLEY TAYLOR, *Associate Editor*

The Housing of Employees from an Industrial Viewpoint

ABOUT two years before the beginning of the World War some interesting predictions were offered by housing experts who had made a practical study of housing as an industrial factor. The most important and interesting prediction, based on a study of industrial centralization and home building statistics, stated definitely that within a decade manufacturers would be forced to give consideration to this problem — not from a paternalistic or even a welfare viewpoint, but because of the actual shortage of houses forecast by a rapid growth of population in various industrial centers.

At that time little significance was attached to the statements of these analysts, who might well be termed pioneers in their field. Manufacturers, even as they are to-day, were loth to enter the real estate business. With here and there an exceptional case of farsightedness, the question of housing was indefinitely tabled.

Suddenly the war developed a tremendous pressure on industrial production, and large contracts calling for a rapid increase of factory employment were placed with existing manufacturing plants, regardless of community conditions. The great volume of production suddenly called for at congested manufacturing points accentuated the evils of rapid labor centralization. As thousands of men attracted by high wages drifted to the war industries, they failed to find homes for their families and they drifted on, creating by far the greatest volume of "floating labor" ever known in this country.

Then came the period of more detailed study of this problem, its recognition by Congress, the formation of the United States Housing Corporation and the development of the Housing Bureau of the Shipping Board.

Then it was that popular appreciation of the wisdom of the pioneers who had predicted the importance of housing as a factor in production became evident. The press was flooded with articles on the subject of housing. Many theories were advanced and thousands of persons for the first time understood the meaning of that often maligned term — industrial housing. Like a great wave this interest rose higher and higher until the end of the war, when it broke and — in the minds of many — became almost a dead issue. Almost all there is to say on the subject has been said and general interest in housing has turned definitely to community conditions involving high rentals and a general shortage of homes. This is not true of manufacturers' interests, however.

Industrial Housing Problem Greater Than Ever

As a matter of fact, it is only since the war and at the present time, that the real problem of industrial housing is assuming a nationally important aspect and taking the place in our economic development long ago forecast by pioneer thinkers along this line. The condition which they expected would develop gradually has been greatly aggravated by the ascendency of demand over production capacity, resulting from the sudden increase in foreign trade and the greatly increased buying power of the American public. At this time, more than ever before, general recognition of the importance of this problem is being evidenced by manufacturers in every part of the country and in unusually varied industrial lines. It is certain that the activity of supplying homes for employees is only now in its infancy. The next few years must show great activity in employee housing as one of the basic problems of industrial production in the United States.

As homes are needed to insure increased production, it is evident that the buying public must pay for these homes as part of the cost of production; but as this payment must necessarily be spread over many years, it is evident that the manufacturer, however unwilling, must be the active financial agent. He must consider housing in the nature of plant investment, a point to be more thoroughly discussed in later paragraphs.

At this juncture there enters the perplexing question of the high cost of building, relief from which, we may safely assume, will not be found in many years, owing to the generally unbalanced condition of the building market. The manufacturer cannot turn, as in past years, to the speculative builder for relief from this burden of housing. The eyes of the speculative builder, who has money for financing, are turned, in higher aspiration, to the need for more expensive city and suburban dwellings where the margin of profit is greater. Bankers are not encouraging building, and the demand for building finance is drawing all available funds to fields of better collateral than that offered by small houses in industrial communities.

The Dilemma of the Manufacturer

To-day, then, we find rapid growth in the number of manufacturers forced into the real estate business. Facing a series of almost paradoxical conditions, the answer to the housing question must be either yes or no — there is no relief to be gained by further "sidestepping." If the speculative builder is encouraged, the definite cost of the house to the employee (whether rented or sold) brings an instant demand for more wages. Exit the speculative builder! Manufacturing costs are already so high that most manufacturers must look to increased production as a remedy; but increased production means more men and often more manufacturing space. The provision of housing as a plant investment, therefore, becomes to many a forced issue. Unwillingly, then (speaking from the industrial viewpoint), we turn to a consideration of ways, means and results.

The How and Why of Financing

The first natural question of the manufacturer involves the possibility of a direct financial return on money invested in employee housing. On this point no time need be wasted — there is no profit in housing, nor can an interest return be expected on any money used except that employed as first mortgage money. The problem must be approached inversely and from a production viewpoint. Will the profit which can logically be expected from the increase in production pay an indirect but definite return on this form of plant investment? Specifically, we may take the case of one New England textile manufacturer, whose mills are now at capacity of production, but who is in a position to sell a greater volume of his goods if he can produce them. His decision has naturally been to build an additional mill unit. With the town already suffering from an acute housing shortage and not enough home labor available to man the new mill, he has wisely inquired as to the housing problem. The answer in this case was definite and as follows:

"Mr. ——, you have decided that the market for your goods will stand a plant investment of $2,000,000 for a new mill unit. The profit is apparently sufficiently attractive for you to have made this decision. To man this plant you must build houses; there is no other way. If the same mill unit which you are figuring at a cost of $2,000,000 costs $3,000,000, will the margin of profit still represent a good percentage and one which would induce you to make this investment — $2,000,000 to be spent on the new mill and $1,000,000 on houses? If so, build the mill and the houses; if not, abandon the idea."

This represents one phase of the housing problem. Another phase involves the question of importing men in specialty lines of industrial work, individuals who are known to be good producers. Invariably one of the first questions will be:

"Can I find a house in your town?"

The natural question is whether or not the value of the services of these men is great enough to warrant a housing investment. Recently one of the great rubber goods manufacturers of this country was considering the question of spending a large sum of money on housing a small percentage of better class male employees. At the suggestion of a housing expert careful inquiry was made as to the actual volume of increased production which might be expected in the affected departments. It was found that in units of increased sales profit a good return could not be expected on the necessary investment. The idea of housing married men was, therefore, definitely abandoned. During the course of the investigation, however, it was found that a large additional unit of female employees would result in a definitely valuable production increase. Women not being available locally, the entire housing problem of that plant was found to center on the question of providing women's dormitories in order to attract the right kind of help. Thus, by the inverse and proper method of figuring the return from a housing investment, the real housing problem was unearthed.

Can the Manufacturer Get His Money Back?

Like the average cold-blooded analysis this dissertation has, in the main, been discouraging up to this point. While it is true that industrial housing must be considered in the light of plant investment, it differs from the average financial unit of such investment in that a large part of the money so used is returnable if the operation is properly handled. In other words, we now approach the old problem of whether houses for employees should be sold or rented.

Unless the manufacturer can afford to keep a large sum of money tied up indefinitely, houses provided for employees should be sold to them on an easy payment basis. This constitutes another perplexing problem, aggravated by the high cost of construction. Houses to-day cost more than the average employee can afford to pay. The cheapest type of livable house costs $4,500 as a minimum, and the houses which should be provided will cost from $5,000 to $6,000, without considering the cost of the land. To meet this condition a number of manufacturers are selling new houses at a loss of from $1,000 to $2,000, this amount being given to the employee as a

bonus, often payable in part at the end of five years (during which he has been in the employ of the company), and the balance at the end of eight or ten years.

During this time he has been making monthly payments on principal and paying interest on the first and second mortgages. The term "bonus" smacks of paternalism, and workmen of America, who after all are very human, do not thoroughly appreciate paternalism. After much analysis and no little experience we feel that the better plan is for the company to give the land (covering the fact by selling the house at a stated cost, which is really only the construction cost) and, under an easy payment plan, charging no interest on the second mortgage. In this manner the actual financial contribution of the manufacturer, an amount chargeable as general manufacturing cost, consists of:

Cost of land and improvements.

Interest on money advanced in the form of second mortgages, returnable over a period of ten or fifteen years.

On a house sold for $5,000, these amounts will total about $1,000, and the house can be sold to the employee at an actual cost of about $35 per month, paid like rent, but actually amortizing so that at the end of ten years the employee owns the house subject only to a sixty per cent first mortgage.

Thus we see this form of plant investment in a somewhat new light and one perhaps more encouraging than at first glance. The position of the manufacturer is that he faces a direct financial loss of only the cost of the improved land. While he gets no direct interest on the second mortgage, he can realize that his indirect interest resulting from the provision of housing may all be credited to the use of the second mortgage money for this purpose. At the end of ten years he has received all of the money used as second mortgage money and during this period the first mortgage money has paid a nominal rate of interest or perhaps it has been transferred to local financial institutions or individuals, thus returning the principal amount.

The Employee's Viewpoint

This is a question in regard to which it is very difficult to arrive at conclusions. In the industrial field the selling of houses to employees on easy terms has so far been largely experimental and not always too well planned. We must, therefore, look to the larger human elements to determine the feasibility of this method of making such a plant investment largely returnable over a period of years.

All of us are human beings employed in the industries of the world. We do not all think in the same terms, but our conclusions are much alike when influenced by a given set of circumstances. Consequently, our subsequent actions are much alike. Thus, if we approach the analysis of this question in a simple, common-sense manner, our conclusions cannot be far from correct. As preliminary evidence we know that the instalment plan of purchase has been very successful in many lines — even in housing as developed by speculative builders in our larger cities. We know, too, that in one form or another we all pay rent.

With this logical beginning let us for a moment place ourselves in the position of the employee, the potential purchaser of a house. He is either employed at a fair wage, but has not a proper house for his family to live in, or he is considering a new place of employment. At one factory a good job is open, but no house is available — at another there is a job and a house — but he must buy the house. He learns that the house can be purchased for a small payment and monthly payments which represent so much cash going out each month just as he has always paid rent. Perhaps the payment is higher than he has been accustomed to. Well, he is getting value in having a place to live where the rent cannot be raised and where he cannot be dispossessed at the whim of a landlord. If the rent (monthly payment) is too high, perhaps there are two wage earners in the family. Certainly it is not difficult to figure whether he can afford to buy or not.

Again, he has the home-owning desire and can be shown that the cost of the house is fair. He knows what his neighbors are paying when they have purchased or rented under to-day's conditions. One important point, however, is this — suppose he loses his job in two or three years?

This is a point of which the manufacturer must take cognizance in his selling plan. He must be ready, in case a man wishes to leave town, to take the house back, refunding payments, but deducting a fair rental for the period during which the house has been occupied. There is also the question of insurance in case the wage-earner dies. This is usually cared for by the writing of group insurance such as that now carried by several large insurance companies and sometimes termed "home-purchase" insurance.

In general, the above paragraphs will give a fair conception of the workman's viewpoint. A few years ago, when the housing shortage was not so acute, the workman took little interest in housing operations. When asked his viewpoint, his answer was usually to the effect that the manufacturer would do better to raise his wages and let

him find his own house. In a manner, this state of mind has not changed, but the condition which has changed is the availability of houses. Nowhere can he find a modern house which can be purchased on such reasonable terms as those which the manufacturer is in a position to offer him. Realizing this condition, wherever the housing shortage is acute the higher wage slogan is not now commonly applied to the workman's opinion of housing. In most instances he is asking the manufacturer to build for him — not waiting for a house to be thrust upon him.

Without question the men who buy houses represent the cream of industrial employees, — thrifty, better workmen with more balanced judgment. If the man is not tied to the town by the escapable ownership of a house, organized labor does not object to housing, but rather encourages it.

It is safe to say that well designed and properly constructed houses, toward the cost of which the manufacturer has made some contribution to offset the high cost of building, will certainly be sold to the right workmen if the financial plan for selling is carefully worked out to keep the monthly payment as low as possible. In selling the houses the small amount of the monthly payment, rather than the selling price, should be stressed.

How Housing Is Being Provided To-day

The solution of the housing problem is being met in a practical manner to-day principally through the construction of houses financed by manufacturers or groups of manufacturers. In many towns throughout the country the Chambers of Commerce, Manufacturers' Associations or Boards of Trade are giving serious study to this question of industrial housing. In a number of towns, housing companies have been formed with equity financing by a group of manufacturers and mortgage financing agreed to by public-spirited local loaning institutions. In addition to this activity, many manufacturers are assisting employees financially in the purchase of existing houses or the erection of new houses on an individual basis.

In each of at least five cities over $1,000,000 has been raised by subscription on the part of manufacturers, department store owners and others who will be directly benefited by increased community housing facilities. What the success of these large organizations is to be is somewhat problematical, but there is no apparent reason why a definite success should not be achieved if contributing members are willing to stand a certain percentage of loss, depending on the care with which designing and building is carried out. In the average town such co-operative activity is difficult to develop on a really practical basis. It is evident that the growing housing problem will largely be solved by individual manufacturers building to meet their own needs.

Many details have necessarily been omitted in developing the facts given in this article. As its object has been principally to direct the attention of those interested to some of the changing conditions in the field of industrial housing, we shall be glad to give detailed information on any point under discussion.

The Problems of Design and Construction

After the general plan of developing employee houses has been worked out, the manufacturer is confronted with the selection of architects and builders. It can be easily realized that a project involving the design and construction of a large group of houses is far from simple and offers many more opportunities for errors of judgment and waste of money than does the average large building operation involving similar values. Certainly good architectural service is required in order that the houses may not only be designed to definitely meet the needs of the types of employees who are to be housed, but the designs must be economical in the efficient use of all space in the buildings and in the use of construction materials. They must be of a most practical nature from the builder's viewpoint, in order that the houses may be produced at minimum costs. It is, however, evident that houses of this character cannot stand too great an architectural overhead cost, but this can be kept comparatively low, owing to the fact that the same unit, with slight variations, may be repeated many times.

The construction of the houses should be good. The provision of cheap houses, with single flooring, paper roofs and other attempts at false economy is not only unfair to the purchaser but represents very poor business judgment. The manufacturer must not forget that these houses may come back on his hands in the course of years and that they represent actual collateral for loans which he has extended.

In selecting a builder it is well to choose one who has had considerable experience in the building of group housing. The problem is entirely different from that of the construction of a large building, and many contractors have come to grief or caused extensive losses to their clients by attempting to construct a housing operation on the system used for larger unit construction. The type of contract which can well be recommended for such a building operation is described briefly in the article on the following pages.

Building Now — and the Logical Form of Contract

IT IS clearly recognized at the present time that high costs do not constitute the only difficult element in considering the advisability of proceeding now with the construction of buildings of various types, the plans of which are already prepared. Owing to unusual demand for what might be termed basic classes of building materials, there has been for some months a steady drain on available stocks. Production of building materials, in spite of strong efforts at stimulation, is greatly hampered by conditions of plant labor, transportation of raw material, coal shortage, lack of machinery and building space, and accidental conditions such as the recent flooding of the works at several hollow tile and brick plants.

In addition to a definite shortage of materials of many kinds, the problem of transportation has assumed formidable proportions. It is common experience on practically all large construction jobs to have carloads of necessary material held on railroad sidings at distant points, with the result that work is delayed at considerable added expense. In many instances, also, material dealers, having definitely agreed to deliver quantities of specified materials at quoted prices, are failing in deliveries owing usually to conditions beyond their control, but sometimes, we fear, being tempted by subsequent offers of spot cash at higher prices.

It is evident now that the bulk of construction, which will proceed in spite of the difficulties enumerated above, may be roughly divided into two classes:

(*a*) Construction necessary for increased industrial production.

(*b*) Construction necessary for increased community facilities.

Apparently a large proportion of construction planned on a purely investment basis will be abandoned to await more favorable conditions in the building material market. The types of construction which may logically be expected to proceed will consist chiefly of factory construction, housing to meet industrial and community needs, construction incidental to improved land and water transportation facilities and public utility buildings and public buildings. In the larger cities some hotel and office building construction may be expected, owing to the unusual profits offered in this type of investment. Any building project which does not come under the general classifications outlined in foregoing paragraphs may wisely be postponed, at least for this year, unless unusual local conditions make the case an exception.

A definite service which architects may provide for their clients to-day consists of a businesslike analysis of the purpose of projected structures in order to assist the owner in determining the wisdom of actually starting building at this time. If the need is of an unusually pressing nature, or if the profits to be gained by an added unit of production, or directly from rentals, are greater than the normal standard (in spite of the necessary investment at high building cost), the architect may feel justified in recommending immediate starting of the work. On the other hand, if this condition is not definite, real service will recommend delay.

The building game to-day demands play with all cards face-up on the table. The reputable contractor must bring all conditions fairly before the architect who, more than ever before, is forced to depend upon good building service and cleverness on the part of the contractor in meeting unusual conditions and in effecting every possible economy. In turn the architect must educate his client to a thorough knowledge of the difficult conditions under which both he and the contractor are forced to work. If the owner is to be disappointed, it is better that the disappointment or disillusionment comes before a large sum of money is invested. The dissatisfied client of a good architect or a good builder to-day is apt to be the client who has had to pay much more than he expected for his building and who has found this to be a fact only after the building was half completed.

The logical question then is — can any one estimate a construction job on a safe basis? The general answer is definitely proven by the unwillingness of contractors, large and small, to undertake fixed price contracts. The only safe manner for an architect to quote costs to a client is to frankly describe the conditions under which builders are working, to give careful estimates with liberal allowances for delay and changes in cost and to refuse even moral responsibility for final costs. The costs quoted must be placed on a basis of comparative logic rather than simply on definite units of labor and material costs.

Certainly this condition will prevent many projects from proceeding at this time, and to a great extent will allow only those buildings to proceed into the stage of construction, which, through one channel or another, will cause a return sufficient to offset excess cost and to protect the owner in his decision to undertake the risk of building now. As a matter of fact, few buildings other than those urgently needed for utilitarian purposes and those where cost is no object will proceed during this year.

To-day, therefore, a great business responsibility is placed upon the architect and on the builder;

together they must shoulder the burden of giving proper advice to the owner. On this basis of service many extensive organizations of the future will develop because of sound advice given at this time of unusual stress. Similarly, some of the larger building and architectural organizations of to-day are committing slow suicide through the encouragement of, or at least passive acquiescence in, the spending of unjustifiable sums of money in building construction. An ultimate realization by the client of their failure to serve will certainly exercise a detrimental influence on future business.

Having reached a definite decision to build, after careful and frank analysis of all contributory conditions, the important question is that of the relation between the building contractor, the architect and the owner. In other words, the selection of the builder, the form of contract and the method of carrying out the work.

Cost Plus Fixed Fee with Penalty and Bonus

Little consideration need be given at present to the straight or fixed price contract. The larger building organizations have for some time been refusing work on this basis and to-day practically no builders, even in the smaller towns, will take fixed contracts. For months the architectural and building journals have carried articles on this subject of building contracts, many by able and experienced writers. Many jobs have been let on the straight cost-plus basis; others on cost plus a fixed fee, while some contracts have carried unusual features based on conditions directly affecting the interests of the contracting parties. A careful analysis of the results of existing and recent contracts shows rather definitely that the best form of contract so far devised is what is known as the cost plus fixed fee contract with penalty and bonus clause; and it would seem that the architect can safely recommend this form of contract as best meeting to-day's conditions — a contract fair and acceptable to the contractor and affording a definite measure of protection to the owner.

The development of this type of contract may be briefly described as follows:

1. Complete plans and working drawings are prepared by the architect.

2. A careful, detailed estimate of necessary labor and amount of material is made by the contractor and submitted to the architect, together with a statement of available materials and definite sub-contract figures.

3. On a basis of the total of the above costs of labor and material the contractor estimates a lump sum as his profit, this being known as the fixed fee.

4. The contractor agrees to a penalty and bonus clause through the operation of which his fixed profit fluctuates according to the relation of the final actual cost of labor and materials as compared to the original estimate. If the final cost exceeds the estimate, the fixed fee amount is to be reduced by the percentage of excess. If the final cost is less than the estimate, the fixed fee amount is to be increased by the percentage of saving.

Thus, on a job estimated to cost $100,000 for labor and materials, the contractor may set a fixed fee calculated at 10 per cent and amounting to $10,000. If the job actually costs $125,000 (an excess of 25 per cent of the estimated cost), the fixed fee is reduced 25 per cent or will amount to only $7,500, a penalty for improper estimating. Inversely, if the finished job cost only $90,000, the contractor's fee would be increased 10 per cent and would total $11,000 — a bonus for good work.

This form of contract offsets practically all objections to the ordinary cost-plus method of building, which has proven so objectionable in past experience; it offers greater protection to the owner than the cost plus fixed fee contract and, finally, it presents valuable checking features, which will assist the architect in his service to the owner.

From the owner's viewpoint the contractor has every incentive to economize and expedite. His interests lie with the owner's. The contractor is not called upon to assume the principal amounts of losses which are beyond his control, and the contract he signs is not a potential bankruptcy notice. The detailed information furnished in the contractor's bid makes it possible to check his buying and estimating ability and, backed by a good reputation for intelligent service, should furnish the best available insurance to the owner that his will be a service of economy and efficiency. It might be noted here that the confusing element of overhead cost should be made definite as one of the estimated costs, thus avoiding any "loading" of the job.

It is clearly evident that through the provision of a simple, understandable contract the unusual conditions of building may be met in a manner which affords merited protection to all parties involved. On this form of contract all parties may work in close co-operation to gain the best results. The contractor who has confidence in his organization and who knows his business will not be afraid to bid on this basis; and the architect who recommends the use of this form of contract and who is careful to check the progress of the work may feel that he is rendering a dependable service to his client.

DEPARTMENT OF ENGINEERING & CONSTRUCTION

CHARLES A. WHITTEMORE, *Associate Editor*

Some Economies in School Construction in Montreal

NOBBS & HYDE, ARCHITECTS

PART I

I. Introductory

At a time when much delayed building of an essential kind must be constructed in spite of what may be called artificial additions to cost due to the loss of purchasing power in the dollar, and actual additions to cost due to a short-weight hour in a shortened day, some economies in school construction may be found to be of interest.

The following notes are derived from a series of schools built for the Protestant Board of School Commissioners of Montreal between the years 1911 and 1915.

Without quoting the standing orders of the Board as to detailed requirements for the various elements of the school plan, a note on the most important element — the ordinary class room — may be of interest. The officials very rightly insist that there shall be no door in the wall behind the teacher, but a blackboard the whole width of the room. Another blackboard is placed on the inner wall (opposite the windows) between the entrance door and the cupboard, which is preferably in that wall. The back wall is provided with rails only for diagrams.

The dimensions of the class rooms are, maximum, 25 by 30 feet, to minimum, 24 by 28 feet. The usual height is 12 feet 10 inches, floor to ceiling. The window sills are 3 feet high and the glass area is one-sixth of the floor area — a rather excessive requirement.

These school buildings are thoroughly fireproof in their construction. The fuel and heating apparatus are disconnected as far as possible from the ground floor, from which the stairs lead up. There is no basement, the space below the ground floor being filled in, except for ventilating ducts and pipe tunnels. Where internal concrete staircases can be suitably distributed throughout the building, external fire escapes are omitted.

For some years before the war the increase in land values in districts where new school buildings were required and the increase in the cost of building have been such that rigid economy had to be exercised, both in construction and planning, to secure the necessary accommodation within estimates based on the past undertakings of the Board.

This situation has led to the omission of two elements formerly held to be essential in a well designed school — (1) large playgrounds for both boys and girls, and (2) assembly rooms. To offset this loss the indoor play rooms, essential in this part of Canada, were greatly improved, and the gymnasiums were arranged and located so as to serve on occasions as assembly rooms.

Bancroft School for Protestant Board of School Commissioners
One of Four Such Types of Building in Montreal

II. A Sliding Front Locker

IN 1913 the possession of a very restricted site at a point where a school of large capacity was required, caused the Board to adopt a plan which discarded the time-honored coat rooms, substituting therefor steel lockers placed in the corridors, which were made 2 feet wider to allow for this additional tax on their capacity.

This arrangement did not at first give complete satisfaction. The defects observed, however, were due, not to combination of locker room and corridor, but to structural errors in the locker itself. In the following year the only building erected by the Commissioners was an addition planned with lockers in corridors serving a few of the class rooms only ; those, in fact, for which it was found difficult to find coat room space. While this installation was pending, the architects secured an 8-foot unit section of the lockers and placed it in their offices for the use of their draftsmen to store their hats and coats. The men were enjoined to handle the contrivance with the least possible care. Under the resulting service conditions, defects soon appeared and provision was made to remedy them and prevent their reappearance with the result that by the time the lockers were required at the school in question a very different and more durable fitting had been produced. The locker room and corridor combination, as revised, met with the approval of the principals concerned with school management, and of the officials who had charge of the buildings and fittings.

Late in 1914, the architects were instructed to prepare plans for a new school to contain 33 class rooms, and after very careful consideration it was decided to omit all coat rooms and rely entirely upon lockers in the corridors for the storage of the pupils' clothing.

Fig. 1 illustrates the design and location of the locker unit. The body is made of 18 gauge steel, reinforced with L and T ribs or bent steel sections. Each section is 8 feet long and serves twelve pupils. The front consists of eight 12-inch sections, four of which are fixed panels and four are connected to a frame which has a lateral movement of 12 inches, facilitated by means of a ball race. On opening the fitting, the sliding and fixed panels come opposite to each other and four spaces of 12 inches each give access to the coat hooks for three pupils. A small but very important detail is that the lateral movement of the locker front is stopped 1 inch short of its full opening (or closing) by a dog, and the last inch is covered at slow speed by a controlled movement. This device serves effectively to prevent damage to the hands of children using the lockers. The locker bottom is formed in wire mesh and the fronts are perforated for ventilation. There are no partitions throughout each unit, the

Fig. 1. Corridor in the Bancroft School Showing Locker Units

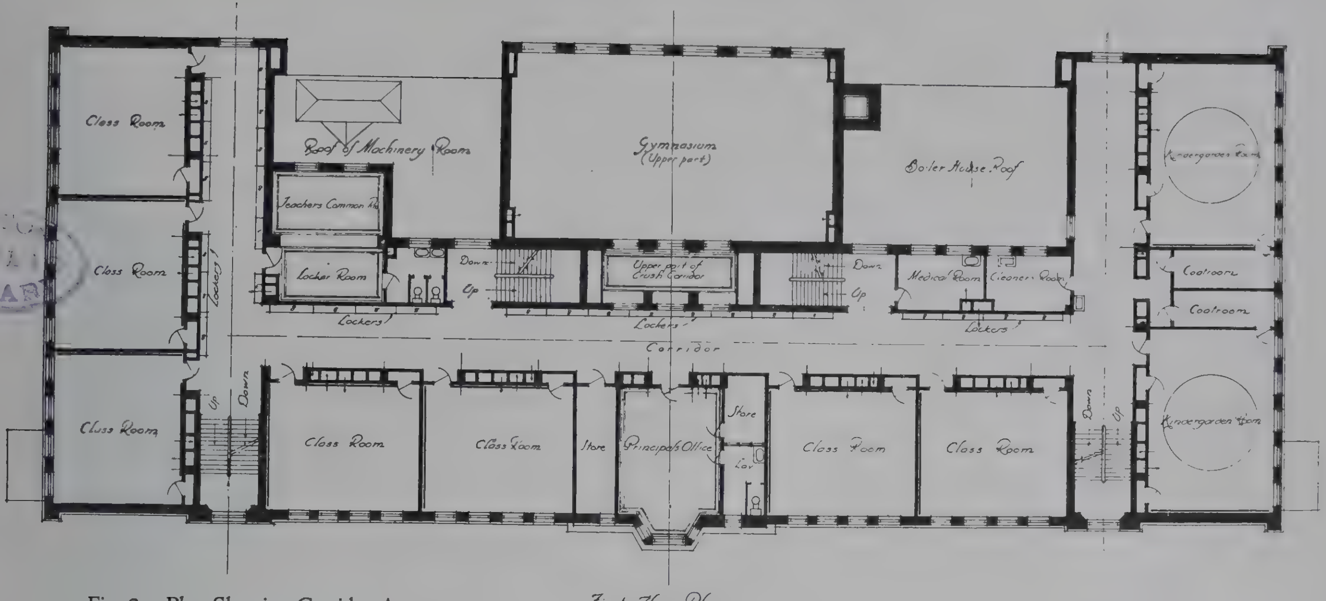


Fig. 2. Plan Showing Corridor Arrangement
Bancroft School, Montreal

Nobbs & Hyde, Architects
for Protestant Board of School Commissioners

wall of the building forming the locker back.

Four 8-foot units are assigned to each class room, giving capacity for the clothing of forty-eight pupils, and the teacher holds the key which opens or closes the four sections assigned to her class. It might be well to point out that the use, in Montreal, of lockers in place of coat rooms puts the most severe test possible on the system, in that the climate necessitates the storage of a maximum amount of clothing for a very large part of the school year.

The school board officials frankly admit that costs being equal they would prefer schools planned on the old coat room principle. They consider, however, that the advantages of the coat room are not so great as would at first appear. One advantage of using lockers is that the pupils gather in the wide corridors instead of in the necessarily confined coat rooms; then again, as the teacher must be present to operate the locker fronts, the pupils are necessarily under supervision.

III. An Economic Floor Construction

IN the earlier of the series of school buildings under consideration, no attempt was made to depart from the usual types of construction in fireproof buildings. Preference, however, was given to flat ceiling systems in reinforced concrete either involving a thick, heavily reinforced slab over the 25-foot class-room span, or steel or terra cotta cores in a concrete joist construction. The flat finished ceiling was considered an essential feature, as it provided, firstly, elasticity in locating the transverse partitions, and, secondly, a plain surface offering no check to the proper diffusion of the forced ventilation. When beams are used for the 25-foot class-room span with normal slab sizes, it means either leaving the beams exposed or resorting to a furred down ceiling, with increase in cost and addition to time of construction.

It was felt by the architects that there were certain objections of one kind or another to all the systems of construction so far employed, and they decided to try an adaptation of a very old method of fireproofing in the case of some additions to an existing school. This might be termed a "steel joist" construction.

A study of the appended floor plan, Fig. 2, will show that the class rooms in all cases are bounded by an external wall on one side and stacks of ventilation ducts on the other. The width required to construct these ducts is 3 feet, but they need not occupy more than half the space available in a longitudinal direction, and the rest is occupied by piers, class-room cupboards and entrances. The 3-foot dimension of the ducts is larger than is required for a reinforced concrete or steel column, and it was found that with the use of brick, laid in cement, a pier of ample strength was economic.

Fig. 3 shows the system of construction used for several recent school buildings in Montreal. The piers are located at 15-foot centers and I beams are used as stringers, one on each side of the pier. A ½-inch steel bearing plate with bond holes extends over the whole pier area as a template for the stringer beams. The "steel joists" span the 25 feet between these stringer beams and the external walls. They are laid on the stringers and they are built into the wall. It was found that 12-inch I's at 31½ pounds spaced 3 feet 9 inches center to center would support the combined live and dead load of 125 pounds per square foot over the 25-foot span. The dimension, 3 feet

9 inches, fitted in well with the plan, as it gave two beams to each window bay and allowed the use of a self-supporting sub floor of 1⅜-inch spruce.

A slab of broken stone concrete, 4 inches thick, envelops the bottom flanges of the "steel joists" and is reinforced with steel rods in two directions. After the concrete slab is poured, ⅞-inch boards are placed on edge on each side of the steel joists as centering for the fireproofing of the beams. This fireproofing in cinder concrete is carried to a level 2 inches above the top flanges of the beams. The centering is left in place to form a nailing base for the sub floors of 1⅜-inch stuff. Tamped cinders to a depth of 3 inches are then added on top of the concrete slab between the fireproofed joists, as deafening material. The I beams on which the steel joists rest are fireproofed with at least 2 inches of concrete. The construction throughout the corridor is a concrete slab 5½ inches thick.

Important points in favor of this combination of steel and concrete may be noted:

1. All the steel employed in this system of flooring is unfabricated. It may be ordered cut to lengths direct from the mills and delivered at the site. This economic advantage is self-evident. In the case of the last school constructed, it amounted to about $35 per ton — shipping and customs duties being serious items.

2. The steel units are comparatively light and may be erected quickly and with the minimum of plant. The gain in time saved through the absence of fabricating operations is also important.

3. The brick piers can be built quickly (only 1,400 brick in each to a story) and when in place they serve conveniently as a basis for the form construction of the next floor.

4. The centering for the slabs is of the simplest, may be very light and can be re-used again and again. No struts are required, as the centers are wired to the steel joists.

5. There being a flat concrete ceiling throughout, no metal furring or lathing is required and the only plastering necessary is one thin finish coat. It must be confessed that the architects at first employed this single finishing coat on a concrete base with some misgiving, but having had no trouble in this connection in the case of a number of schools, they consider the method entirely sound. The greatest care, however, must be taken to have the cement surfaces absolutely free from dust or dirt of any kind and to keep them as wet as possible before the plaster is applied.

6. Economies aside, a practical advantage is to be found in the fact that the fireproof slab is placed where it can do most good enveloping the bottom flanges of the steel.

7. The heavy under floor which takes the place of the ordinary ⅞-inch sub floor and sleepers does not increase the amount of wood employed. It also forms a really substantial base for nailing the ⅞-inch birch finished flooring.

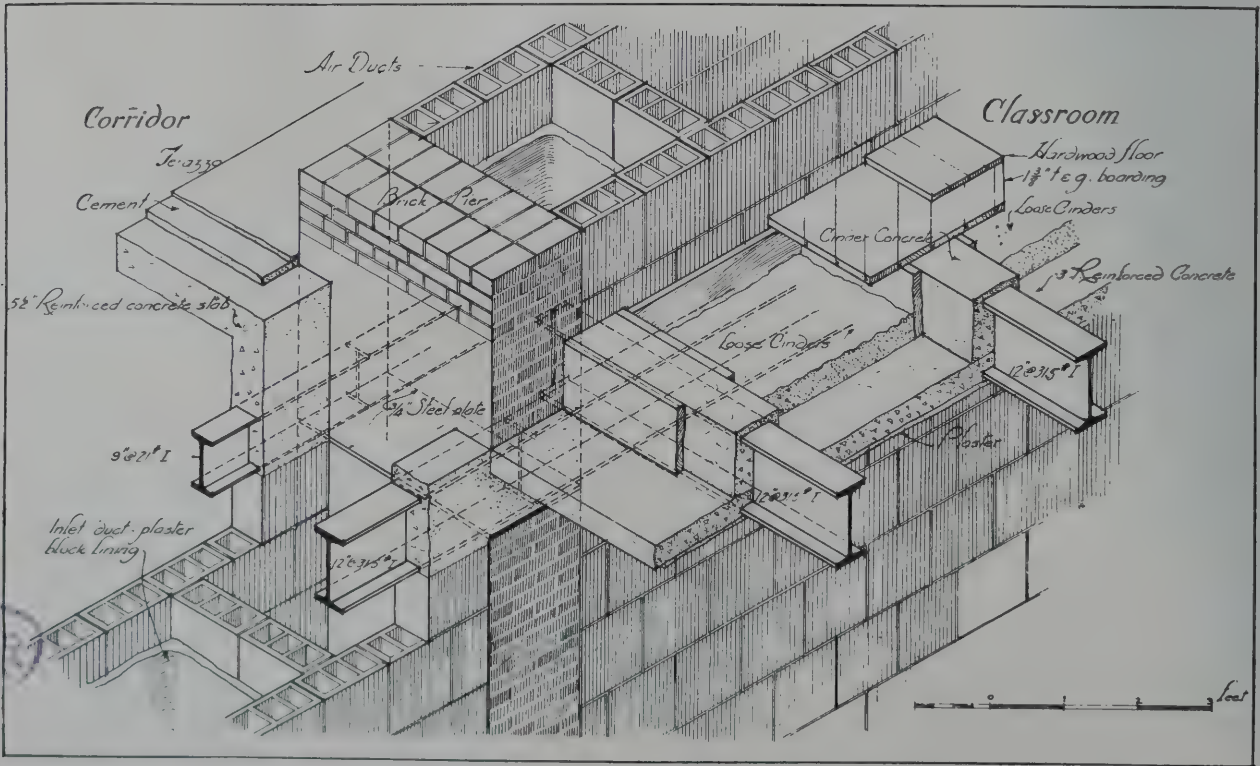


Fig. 3. Diagram of Vent Shafts, Interior Piers and Floor Construction

Heating and Ventilating

PART IV. (Concluding Paper)

By C. W. KIMBALL

THE knowledge of a few simple, practical rules for determining the size of the various units of a heating system is often of great value, and a number of rules worked out in practice, together with suggestions for specifications and superintendence, are given here.

Rule for Computing Boiler Sizes

Cast iron up-draft boiler. — The size of the boiler should be at least 80 per cent greater than the actual amount of radiation in radiators and coils.

Cast iron down-draft boilers should be ....60% greater
Steel fire box, brick set up-draft boilers should be ....35% ,,
Steel fire box, brick set or portable, down-draft boilers should be....40% ,,

Where coils are to be inserted in the boiler for heating water for domestic purposes, the size of the boiler should be increased, figuring each gallon of water-tank capacity as equivalent to two square feet of radiation.

Piping System

In planning the piping system to supply the heating surfaces the mains should be as direct as possible; kept large, with the minimum number of bends; should be evenly and uniformly graded and located in the building where they will not be unsightly or undesirable.

As to the sizing of the pipes used as mains and risers there are many rules and formulæ, but the lists given below will serve as a guide. Unusual lengths and exposures will require special sizes.

HOT WATER

Supply and Return			Sq. Ft. Dir. Rad.	Sq. Ft. Indir. Rad.
1″	and	1″	50	30
1¼″	,,	1¼″	75	55
1½″	,,	1½″	110	80
2″	,,	2″	200	150
2½″	,,	2½″	320	235
3″	,,	3″	550	400
3½″	,,	3½″	800	575
4″	,,	4″	1,100	790
5″	,,	5″	1,800	1,350
6″	,,	6″	3,000	2,000
8″	,,	8″	6,000	4,200

STEAM

Supply and Return			Sq. Ft. Dir. Rad.	Sq. Ft. Indir. Rad.
1″	and	¾″	48	36
1¼″	,,	¾″	96	72
1½″	,,	1″	200	150
2″	,,	1¼″	300	200
2½″	,,	1½″	600	400
3″	,,	2″	1,100	700
3½″	,,	2″	1,700	1,200
4″	,,	2½″	2,400	1,600
5″	,,	2½″	4,100	3,000
6″	,,	3″	6,700	4,500
8″	,,	3″	14,000	10,000

The sizing of mains, especially of steam mains, is somewhat dependent on the height of the radiation and mains above the water line of the boiler. The higher the radiation and piping are above the water line the more radiating surface the main will feed without difficulty.

The writer's twenty years' experience in planning and supervising installations of heating systems has shown that constant watch must be kept during the planning of a system and its installation. The following are some of the points to be looked after in preparing and checking plans and specifications, and in superintendence.

Plans

Look carefully to see if there are any rooms with bad or unusual conditions such as cold roofs over, or cold hallways under or adjacent, cold floors or ceilings or unusual exposure to winds if building sets up high. See if these are recognized in determining the capacity of the radiation.

Look over the radiator locations to see if there is sufficient space for each, and also examine the placing of risers and returns to avoid interference with constructional or decorative members.

Study the run outs from risers to radiators. Are they short or long? If they are long (over 4 feet) make them one size larger. Can they be run as shown on account of doors, timber, beams or girders, etc.?

Keep all radiators high enough above the water line of boilers, — directs 30 inches, indirects 36 inches, minimum.

Plan risers and run outs so that they will not cut through cornices or pilasters. Conceal risers where they would be objectionable if exposed.

If risers or radiators are concealed be sure the plans call for the necessary slots, if in masonry. If pipes are cut through timbers, girders, etc., see that holes are large enough to allow for pipe expansion. If pipes are to be covered see that slot or partition is sufficiently wide and deep.

Show indirect radiators large enough to scale so that sheet iron casing may be accurately estimated. See that each stack may be located properly without interference with construction.

If indirects are bunched in groups see that provision is made so that floors above will not sag under such an unusual weight.

Does any indirect stack interfere with head room or shut off light?

Boiler Room

Are safety valves in accordance with state laws?

No boiler blow offs should be over 2½ inches and each should have B. O. cock and valve.

No safety valve should be larger than 4 inches.

Plan to get smoke pipe in place and still leave 12 inches over it, unless building is first class.

See that smoke pipe does not interfere with manholes, nozzles or drums of boilers.

Show dampers and cleanout doors on smoke pipe, also chimney cleanout doors.

Where the large sectional boilers are used, plan to make ash pit 6 inches deeper then boiler castings.

See that feed pipes to boilers are plainly marked or specified, also blow off.

If blow off tank is required see that it is called for of proper size for the work to be done.

See that it is plain where cold water connection is to be made, also sewer or drain connections for blow off. The plumber should leave a tee in the cold water pipe near boiler. Does the plumber or heating contractor make final water connection? Make water and steam balance pipes amply large.

Drip boiler drums at each fitting to prevent any pocket and put gate and check valve on drip.

See that sewer is low enough to drain boilers and blow-off tank; if not, see that provisions are made for sump well with ejector or cellar drainer.

Piping

Plan all the steam piping above water line of boilers at least 30 inches and preferably 36 inches.

Avoid all stairways, stair wells, windows, doors, transoms, girders, etc., in running the mains, so as to avoid pockets and extra drips or getting mains under water line of boiler.

Keep mains out of vegetable rooms and other similar rooms as much as possible to avoid overheating. If no other location is possible see that all pipe and fittings are well and properly covered.

Be sure that mains do not interfere with the swing of the doors or windows.

Look out for the expansion of the mains and run outs. Take care of this with offsets and swing joints if possible, otherwise use expansion joints.

Never use 1-inch pipe on one-pipe work for supply where steam flows one way and water of condensation must flow back against steam.

In sizing pipes see that the ends of the system are favored, as they are likely to be the least effective part of the system.

Provide for drips in the steam mains often enough to keep the mains dry and to drip all pockets.

In laying out piping, pitch mains so that the flow of steam and water is natural. Returns and hot water mains should pitch toward the boiler.

Never hang an indirect stack in toilet room or similar rooms if you can help it, on account of odors. If no other way is possible cover stacks and ducts with asbestos.

Plan accelerating coils where necessary to assist the removal of vitiated air, and on a separate system of piping.

Plan valves on each accelerating coil riser, also air valve and check on return, if gravity return system; if vacuum system omit air valve and put vacuum valve on return.

Plan for accelerating coil near the vent opening from each room. This is preferable but not always possible. A large coil in vent head will do if space is not available for separate stacks.

Connect hot water tank to boiler piping so that the steam coil will heat the water without requiring a separate heater.

Is hot water tank provided with hand and also thermostat valves on supply, and valve and check and air valve or vacuum valve on return, also relief valve of lever type?

If there are any pipes buried under the floor, see that tile pipe and proper covering are placed around them and also see that a draw-off valve is provided to drain the pocket.

See that steam mains and returns are valved alike and for every supply valve there is a corresponding return valve and check.

See that each riser and return valve is tagged, showing what the valve controls. Every boiler room and engine room should have a diagram of the riser and return system.

Specifications

Do heating specifications provide for cutting and patching? also pitch of pipes? (Supply, 1 inch in 10 feet. Returns, 1 inch in 8 feet.)

Specify hot water tank and large indirects to be supported from walls or pipe stands.

Specify damper regulator, stating whether for low or high pressure service.

Specify kind and location of pipe covering and bands, also painting of pipes if heating contractor is to include it.

See that air valve specifications are right. Use float air valves in all cases where water would cause trouble if it escaped from air valve unless a drip line system is called for.

Have fan foundations, heater foundations, boiler foundations, boiler settings, pump foundations and any pits been provided for in specifications? Are trenches provided where pipes are below floor?

If galvanized iron pipes or risers are to be covered, see that it is mentioned in the galvanized iron specifications; also see that the painting of sheet iron work is specified in the same place.

Call for globe valves on engine and pump drips and on supply pipes to engines, pumps. All other valves may be gate valves except on radiators where modulation, quick opening or disc valves may be provided.

See that motor wiring has been provided for.

See that the general contractor's specification calls for cutting and patching, also for water and sewer connections.

Conflicting Paint Purposes

By GUSTAVE W. THOMPSON

THE object of this paper is to point out that the specific purposes for which paint is used are not entirely independent of the incidental purposes for which paint is used. Each purpose, whether specific or incidental, in most cases limits every other purpose, and the best that can be done is to obtain that happy medium which is dictated by good judgment.

To illustrate this point by a simple example, we will note that red lead paint, which is probably most generally accepted as the best protective paint for iron and steel, when used for railroad work, cannot be left in the red state, as railroad managers have ruled that as red is a danger signal, no red objects shall be allowed to appear along the railway route because of the possibility of giving a false signal to operating men. The result is that while railroads generally specify red lead paint for undercoating they require that it shall be covered with the dark paints that approach the black. In this example, a compromise is reached whereby the red lead paint is used for undercoats for protection, and dark colored paints used for finishing. The dark colored paints used have a purpose distinct from that of the red lead paint, and, in fact, these dark paints may have little protective value in the sense of preventing the corrosion of the iron or steel.

The purposes for which paint may be used, both specific and incidental, for exterior painting are protection, cleanliness and decoration. The purposes for which paint may be used, both specific and incidental, for interior painting are protection, cleanliness and illumination. The purpose of cleanliness includes the more definite purposes of sanitation and washability.

Let us give consideration to outside paints first and let us see how the purposes for which such paints are used more or less limit each other. By the protective value of a paint we mean its ability to preserve materials painted. This protective value is largely dependent on the durability or permanence of the paint itself. While it is desirable to select paints having great durability and consequently great continued protection, it is seldom practicable to select paints solely with this purpose in mind, for some of the most durable paints are the least decorative. For instance, black paints are generally considered as the most durable and permanent of paints. Black paints, however, have not much demand for decorative purposes. Their use on the exterior of buildings is very limited, in fact, their use is almost entirely confined to finishing coats for iron or steel, railings, fire escapes, etc. Once in a while black paints are used for decorative purposes for line effects.

When we speak of black paints being generally considered as the most durable and permanent of paints, it must not be considered that we are advocating their use as protective coatings for iron and steel. There is one particular objection to black paints for the protection of iron and steel which militates against their more general use. This particular objection is that black paints are pretty much of the same color as iron and steel, and good continuous coats are difficult to obtain by their use.

Many strikingly red paints are also very durable. Some of these contain the oxide of iron pigments, and others are of the type of red lead paints. The use of red paints for decorative purposes is greater than black paints. Red roofs are fairly decorative and occasionally buildings are painted red. The use of red paints on the exteriors of wooden buildings can hardly be considered as common, except, of course, farm buildings; and also it has been found satisfactory to paint freight cars red, ignoring almost entirely the question of decoration.

In general, it may be stated that where highly decorative results are desired, the light tinted paints are more generally selected. These paints give reasonable durability and there is an infinite variety to select from. They vary in hue, strength and luminosity. White paints also have a great demand from the standpoint of decoration, although it is debatable whether white paints in mass are selected because of their decorative value or because of their strong appeal to the sense of cleanliness. Where they are selected, it will in many cases be found that the sense of cleanliness has been gratified to some extent — cleanliness thus becoming a decorative effect. From these considerations it is obvious that the three specific purposes for which exterior paints are used more or less control each other. Protection, cleanliness and decoration cannot be considered solely by themselves, and there must be a compromise reached where no one of these purposes is lost sight of, but each is considered and allowed to control the selection of paint with a due regard to the sense of proportion.

The durability of exterior paints is dependent

upon many factors. The decay of paint in most cases is due to the destructive action of light, moisture and the oxygen of the air upon the vehicle or binding material contained in the paint. This vehicle or binding material is usually linseed oil, which is a more or less unstable organic compound subject to oxidation and more or less subject to decomposition by moisture. It appears that light rays also have an important influence upon the oxidation of linseed oil. To secure paint durability, therefore, it is necessary to prevent as far as possible the destruction of the oil in such paints. Much study has been given to the question as to how this destruction of the oil can be prevented or rather reduced to a minimum, and many speculations have been advanced, and these speculations have been developed into fairly well defined theories.

In considering this phase of the subject, we must first emphasize that all of the matters that we are speaking of must be thought of as relative and not absolute. There is nothing absolute with reference to any of the properties of paint. There is no such thing as absolute durability, either of pigment or of vehicle. There is no such thing as absolute protection by means of paint. There is no material used for construction that is absolutely permanent. We can only speak of these things in the relative sense, as, for instance, when we say that pigments in paints are more durable than the vehicles and when we say that the destruction of paint is due to the destruction of the vehicle, we mean that the destruction of the vehicle proceeds more rapidly than the destruction of pigments; so that the life of a paint may be measured in terms of the life of the vehicle. The durability of paints is relative in the sense that we can say simply that one paint as applied is more durable than another. We can speak of the durability of structural materials in the sense that one structural material will last longer than another; thus, that painted steel will last very much longer than unpainted steel.

In securing durability of vehicle we should not seek to get anything like absolute durability. All we should seek to do is to get maximum durability. We would illustrate this point in this way. We know that linseed oil by itself does not make a good protective coating. We know that white lead as a pigment by itself and without any vehicle would not make a good protective coating. By mixing the two we get a certain amount of durability. By mixing the two in a proper proportion we get a maximum amount of durability. The proportioning of pigment to vehicle in order to get the greatest durability is an art based upon experience; in fact, experience is the only safe guide. Scientific study, however, indicates that when by proportioning a paint so as to get maximum durability, this maximum durability is obtained when the decomposition of the vehicle is retarded by the protective action of the pigment. These considerations led Dr. Dudley of the Pennsylvania Railroad to go to the extreme and say that the pigment in a paint is the life of a paint. Dr. Dudley was probably a little extreme in this form of statement, but he had a clear conception of what he meant, which was that the protective action of the pigment prevented the destruction of the vehicle and thereby prolonged the life of the paint. Considering the durability only of a paint film, it is generally recognized that the greater the proportion of pigment present, as compared with the binder, up to a certain point secures maximum durability through the protective action which that pigment exercises upon the vehicle.

The protection which a pigment exercises over the vehicle in which it is suspended is due to the fact that it prevents the oxygen and moisture in the air from getting at the vehicle. It also prevents as ready access of destructive light rays. Of these three destructive influences it is probable that moisture is the most active — moisture acting to produce a chemical decomposition of the oil. The more pigment there is present in a paint, the narrower are the avenues for the entrance of moisture and the particles of the pigment are closer together. What is true in regard to the entrance of moisture is also true in regard to the entrance of oxygen in the air and of light rays. The avenues of entrance are narrower the greater the proportion of pigment present.

There is another point which must be considered here, namely, paints that contain linseed oil are liquid before application, but become substantially solid on drying. This change from the liquid to the solid state is due to the oxidation of the oil. A certain amount of oxidation, therefore, is necessary in order that a paint should perform its proper purpose. It is a common practice to think that when a paint coat is dry to the touch it is necessarily in a suitable condition to receive another coat of paint on top of it. This idea is, unfortunately, wrong. Not merely must a coat of paint on which another coat of paint is to be applied be dry to the touch before the other coat is applied, but to get good results a reasonable length of time should be given for the undercoat to develop its oxidation to a much greater extent so that by its oxidation a sufficiently hard undercoating will result to withstand the pull of subsequent coats. When paint checks, that is when there appear fine lacelike lines upon the surface of the paint, it can be generally attributed to the failure

to allow the undercoat to dry sufficiently before subsequent coats are applied. The length of time desired between coats depends upon the willingness of the owner or architect to wait for the final coat to be applied. Much more durable results would be obtained if a week were allowed between each coat of paint, but this is not often considered practicable. And here, again, there must be a compromise between the urgency of the work and the durability of the finished paint, where some sacrifice of that durability must be expected in order that the work shall be completed promptly.

Considering durability alone, therefore, we amplify our statement to the effect that maximum durability of paint is obtained by that proportioning of the oil and pigment which will give the greatest amount of protection to the oil by the pigment, and also where the maximum allowable time is granted between coats.

Considering now the question of cleanliness, white paints appear after being applied as the cleanest of paints, but white paints are the most difficult to keep looking clean, because dirt shows most conspicuously upon white paints. We have referred in considering durability to the fact that the most durable paints are those which have a high proportion of pigment. Such paints, however, will not dry with a full gloss. This has a bearing upon the question of the cleanliness of paint. Paints with a full gloss do not dry as hard and consequently do not keep as clean as paints having less gloss. You will, therefore, note that durability and cleanliness go somewhat hand in hand, and there need not be much of a compromise between durability and cleanliness in this particular. There is a popular demand for high gloss paints for exteriors. We believe that this popular demand can be met only with a sacrifice of durability and cleanliness. We are not advocating flat paints for exterior work. The paints that we are advocating are those which are midway between what might be called semi-gloss and gloss paints.

While tinted paints do not appeal to the sense of cleanliness as much as white paints do when first applied, it has generally been found that tinted paints remain cleaner longer and consequently gratify this sense of cleanliness for a longer period.

Coming now to the question of decoration, we believe that this, as a rule, is the most predominant and important purpose for which paint is used. It would be outside of the scope of this paper to discuss decorative schemes. There are so many combinations of color from which selection may be made and there are so many aspects to color problems, that this whole question is a study by itself. We will, however, say this much. Decorative effects are light effects and all single light effects are due to the character of hue, hue strength and luminosity. Color effects cannot be considered as purely hue effects, because hues necessarily vary in strength. Furthermore, there is no hue alone that does not carry with it a certain amount of white light which acts more or less as a diluent. The effect of a single color as compared with another color upon the eye is due to difference in hue, hue strength and luminosity — luminosity representing the amount of white light which comes to the eye.

The simplest forms of color harmony are those in which the hue in two or more colors differs in strength with practically no variation in the character of the hue or its luminosity. Next in order come differences in luminosity alone, the strength and the character of the hue remaining the same. Then we may have simple color harmonies where both the strength of the hue and the luminosity vary. In simple decorative exterior painting these forms of color harmony are often used, but they are by no means the highest type of decorative effect. The highest decorative effects are obtained when there are combinations of two or more hues as separate parts of a color scheme which blend in the eye to produce the sense of harmony. We cannot proceed further with this discussion, however, as our main point will be to show that there are limitations in the decorative art due to the character of pigments which are available. There are a great many pigments to select from and yet they are limited in number when exterior painting is considered, because of their limitations as to hue, strength and luminosity and also to durability. Fortunately, however, from the standpoint of refined decorative desires, there is ample variety of pigments to select from. It is only when extreme decorative ends are sought that difficulty is experienced. There is, therefore, a real although not important limitation placed upon the use of paints for exterior decoration due to the fact that only pigments of considerable durability can be used. There are a great many pigments such as lakes and pigments made with coal tar dyes which are not sufficiently durable for use in exterior paints.

Coming now to the interior paints, protection of surfaces painted is usually a secondary object. Decoration is the main purpose. Illumination and cleanliness together with sanitation and washability each play an important part. Of course, in so far as protection implies durability in the case of interior paints, then durability is an important factor.

The durability of interior paints refers principally to mechanical injury. Interior paints do not decay as do exterior paints, probably because they

are not subjected to as severe variations in atmospheric conditions, including temperature. Interior paints, in general, are flat paints or gloss enamel paints. Except for the poorest classes of work, gloss paints, where the binder is linseed oil, are not used. This is because such paints do not harden sufficiently and become soiled very easily. Flat and enamel paints of the best modern types are neither too brittle nor too soft. They are hard enough to avoid becoming soiled easily, and also can be properly cleansed, and are soft enough to avoid scaling through mechanical injury.

Cleanliness is an important purpose in the case of interior paints. For a paint to be kept clean, it must be reasonably smooth and reasonably hard. Enamel paints are the easiest to keep clean, and if built up on proper foundation of white lead, hardly any paint gives greater satisfaction, except, as we will show, when considered from the decorative standpoint. Enamel paints are, furthermore, more washable than flat paints, although flat paints which are not too flat will wash nearly as well as enamel paints.

Sanitation, as a purpose of painting, is more important in the case of the cheaper dwelling houses, hospitals, etc. Nearly all paints are antiseptic during the period of drying, due to the decomposition and volatile products given off during the drying of the paints. Of course, if it were desirable to paint purely for sanitation, ignoring durability, decoration, etc., interior paints could be designed of very high sanitary value. Sanitation is nearly always made a consideration secondary to the other valuable purposes for which paint is used.

The illuminating value of paints for interior use is one of the most important considerations to be borne in mind. All white paints have approximately the same illuminating value. Tinted paints have less illuminating value, and the dark paints have very little illuminating value, so that if illumination alone is considered, white paints should be used. There are other important limitations, however, that must be considered. These are : in general, white paints are not as decorative as tinted paints ; white paints are harder on the eyes than tinted paints. Inasmuch as the value of illumination is limited by the physiological limitations of the eye, it seems probable that white paints have not the effective illuminating value that is attributed to them. The pupil of the normal eye contracts when looking at excessively illuminated objects and dilates when looking at poorly illuminated objects. Excessive illumination, therefore, may result in the contraction of the pupil of the eye, cutting down the amount of light that reaches the retina and really rendering the illumination less efficient. These contractions and dilations of the pupil of the eye take place between certain limits, and it seems clear that illumination in general should be such that the pupil of the eye is neither unduly contracted nor dilated. Another thing to consider is that for illuminating purposes, flat paints are better than gloss or enamel paints, for the reason that with flat paints there is a greater diffusion of the light with less contrast of light and shade, which is desirable both from the illuminating standpoint and from the decorative standpoint.

In the matter of decoration there is, of course, a much wider scope in the case of interior paints than there is with exterior paints. Many pigments can be used that are reasonably durable for interiors which would perish quickly on exteriors. Interior decoration is more complex than exterior decoration, as every room demands a more or less special treatment.

We see that there are many, as it were, conflicting interests to be considered in the selection of paints for interiors. In order to harmonize or rather compromise these various interests, we propose to lay down a few general rules with regard to interior paint. First, if high gloss paints are used they should be enamels, and except in hospitals they should be used only in those places where they do not interfere with any other purpose. Second, enamel paints should be used principally on the trim and doors and in bathrooms. Third, enamel paints or near enamel paints should be used in hospitals except in those places where eye strain might result. Fourth, all large surfaces should be painted with an eggshell gloss so as to get the proper diffusion of light. Fifth, pure white paints should never be used, but should be tinted slightly to harmonize with the general tone of the room. This applies to ceilings even when calcimined.

It will be seen from this paper that we do not believe there is any one purpose for which paint is used that can be considered a dominating purpose. All other purposes for which paint is used have a value to be determined by the peculiar demands of the case. In selecting paints, therefore, extremes must be avoided and a sense of proportion always in control.

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CONTENTS for JUNE 1920

PLATE ILLUSTRATIONS

LETTERPRESS

ALBERT J. MacDONALD, Editor

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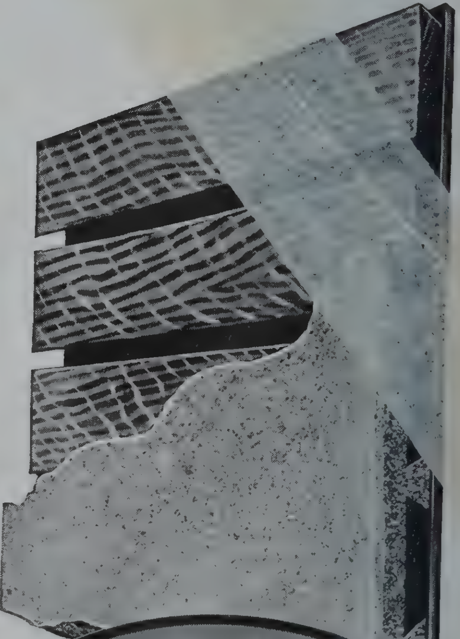
Bishopric Board Grips Stucco

and Locks it Securely for Generations—



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THE EDITORS FORUM

ARCHITECTS' OBLIGATIONS IN CRITICAL BUILDING SITUATION

THE difficulties encountered in all phases of the construction industry to-day and the consequent high cost of building make the study of our methods of building an obligation to be met by architects. In common with other American industries wasteful practices have been permitted in building, not intentionally or knowingly, of course, but with results quite the same, nevertheless. To-day the burden of cost is so great as to prevent the construction of any buildings except those of the greatest necessity or where abnormal returns can be had that are in proportion to the investment.

There is, furthermore, little reason to expect any great improvement in this situation. The shortage of buildings that now exists will steadily become more acute. This is of especial seriousness in the field of housing. Recent reports from New York City indicate that in spite of new construction there are to-day less living quarters in New York than at the beginning of the year. This is caused by the large number of alterations of old residential buildings into offices and shops. The limited building activity to-day is confined to structures affording the largest rate of return; speculative builders are investing their funds in existing buildings which can be altered and produce a handsome profit in view of the demand for space of all kinds. This effect is further seen in such important operations as the alteration of the Knickerbocker and Manhattan hotels in New York into office buildings. These hotels occupy extremely valuable sites, and with the present demand for office space a greater return can be had from such use of the buildings. These operations provide an interesting instance of the manner in which capital is attracted to the sources of greatest earnings and indicate the difficulty of securing financial assistance for housing with its low rate of return.

This trend of affairs, however, is not meeting the issue. It temporarily solves one difficulty but in doing so aggravates another. What we need is more new buildings. The present conditions must be met and a way found to produce the buildings. One logical and easily possible way is to evolve means of eliminating the waste in buildings. It should be possible to revise our ideas of planning so that buildings could be erected in which nearly 100 per cent of their area would be usable and income-producing space. If this result could be had it is not difficult to conceive a building erected to-day at a cost but slightly in excess of one of a few years ago that provided the same rentable area.

This point is clearly indicated in the paper on "Economy in School Planning," by W. R. McCornack, architect for the Board of Education of Cleveland. It is quite probable that the money spent in former years in the construction of waste space in our schools would be sufficient to pay the entire cost of the school buildings we need to-day. This condition applies not alone to schools; it is equally important in office buildings and apartment houses, in fact, in any type of building you choose to name.

The solution of the present difficulty must come through more careful attention to the principles of planning. Building plans should be made to conform easily to economical methods of construction; effort should be made to take advantage of standardization whenever possible, and non-productive space should be reduced to the absolute minimum. These conditions are limiting, yet to meet them, we need not hamper our architectural expression. True architecture is a product of its time and conditions and this is as true to-day as in the Renaissance period.

STIMULATING GOOD TASTE

AN exhibition of home furnishings made and sold in Rochester, N. Y., was displayed in in the School of Applied Art, Mechanics Institute, during the week of May 2d to 8th. The primary aim of the exhibit was to display moderately priced furnishings. The purpose was purely educational and has created an unusual amount of interest in the community.

The exhibit was constantly attended and developed many inquiries showing that the public is keenly alive to the need of making wise selections in decorating their homes.

Two living rooms, a dining room, a hall and a bedroom were completely fitted out and were supplemented in another part of the building by comparative groups of furnishings showing well chosen pieces and others less desirable, the first group in each case costing less than the second group.

It is planned to establish a free service bureau at the school where the public generally may make inquiry concerning decorating and furnishing of their homes. Instructors will advise with them and recommend material which may be purchased in the community. The exhibit proved to be not only successful, but received the cordial backing and co-operative support of both manufacturers and retailers throughout the city.

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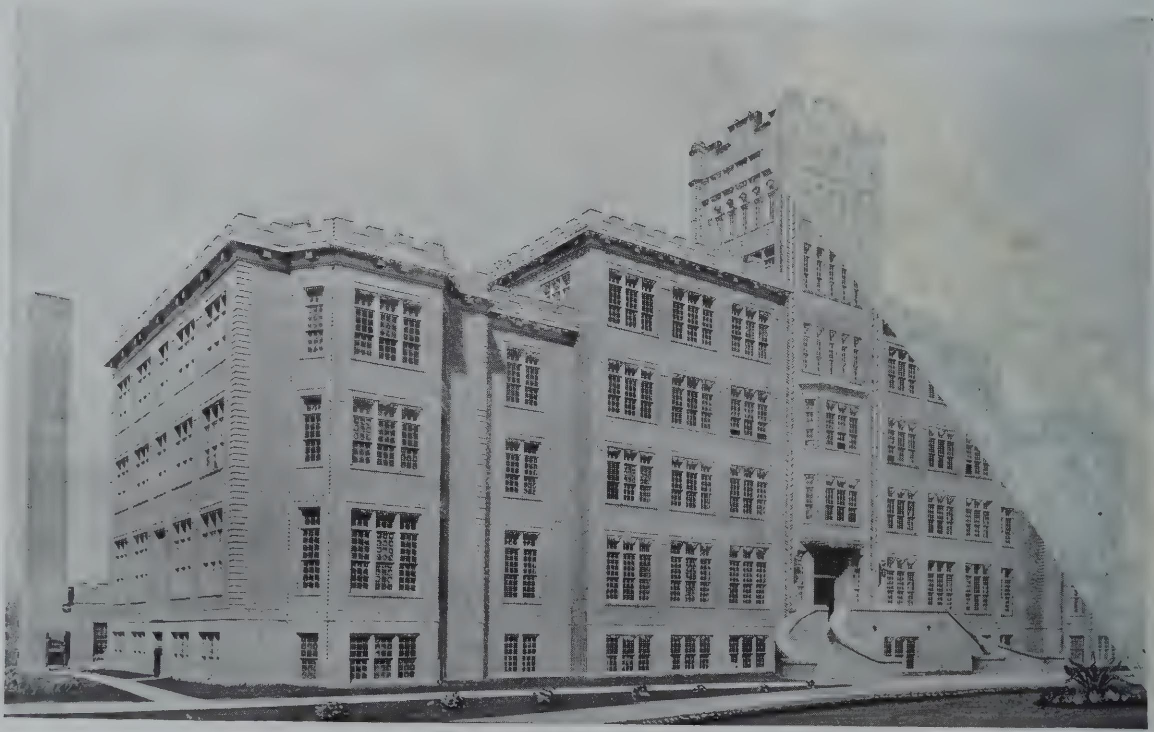

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The
ARCHITECTURAL
FORUM

VOLUME XXXII JUNE 1920 NUMBER 6

Economy in Schoolhouse Planning

By W. R. McCORNACK, ARCHITECT, BOARD OF EDUCATION, CLEVELAND, OHIO

> *THE excessive cost of construction to-day should lead all architects to consider fundamental principles of plan because any element of waste area adds a burden of cost that to-day cannot be justified. In this paper, which was read before the National Education Association at a recent meeting of that body, Mr. McCornack points out some tangible results of saving in cost where the question of plan receives careful consideration. It is particularly addressed to school authorities but its value to architects is not of lesser consequence, for their function to-day should be to lead in meeting the difficulties with which all construction is beset.* — EDITORS.

A PROMINENT state official recently made public a statement that millions of dollars are being wasted in the state of Ohio in costly façades to school buildings. Unfortunately, this reflects an erroneous but often popular opinion, the facts being that in the most ornate public school buildings all the stone work, including base courses, steps, window sills, belt courses, coping and ornamental work, does not exceed 4 per cent of the total cost of the building and the ornamental stone work not more than 1 per cent. For the æsthetic welfare of any community this small expenditure can and should be defended.

It is a fact that there is a greater percentage of poorly designed and poorly built schools in this country than any other type of building, except some of the very cheapest commercial forms.

It is also a fact that only a very small percentage of the architects who have attained a commanding position in the profession, due to careful training and experience, plan and build schools.

Why is this true?

It is true too often because school authorities listen to architects who present their cases on the basis of cheap commissions, and because they claim they can build school buildings for less money than their competitors, and also because the architect and educator fail to co-operate.

When the knowledge becomes common that a school is to be erected in a community, not only are well qualified architects considered but less qualified of the profession present their cases, the latter agreeing to do the work for 3 or 4 per cent, when it is a well-known fact that no architect can provide thorough study and good service for any such price. Yet many of the school authorities will be influenced by this argument.

Any architect who agrees to do work for less than the recognized rate of compensation, and who guarantees to build for a certain price or forego his commission, is ignorant of the service he should render his client, or he is dishonest, or he is both. How can an architect guarantee a price when he has no drawings before him, when contractors estimating from completed drawings vary so much in their estimates?

You buy clothing or any other material and expect to pay the merchant 15 per cent or 20 per cent or 25 per cent profit. Without question you allow the contractor 10 per cent or 15 per cent profit with his overhead, but the architect is supposed to provide more service and assume more responsibility than the contractor, and the architect's smaller fee must include his overhead and what profit he can make, and generally the low commission architect slights his work to squeeze out his profit.

Not until we appreciate architectural service on a higher plane with higher fees, and make the architect financially responsible for all the errors in his plans, will school authorities secure service which means the elimination of waste in schools, better buildings which means minimum architectural maintenance cost in the future, and structures of such quality that they will be an asset to the community.

We talk more of standards and standardization than we do of the great, broad problems of planning and construction. Standardization is an ex-

cellent thing, but it can lead us into dangerous bypaths, as in this instance.

In the Cleveland school system for years a certain desk was standardized. This desk required a room 25 feet wide and 32 feet long to seat forty-two desks of a given size. By redesigning the furniture it was found possible to place the same number of desks in a room 24 feet wide and 28 feet long, thus bringing about a saving of 3,000 cubic feet per room, which at a per cubic foot cost of 20 cents means a saving of $600 per room, or more than double the cost of furniture. In a thirty-room building this means a saving of $18,000. This amount at compound interest for fifty years, or the life of a building, amounts to $20,000 per room, or $600,000 for a thirty-room building — enough to meet the cost of constructing the building.

What seem to be very minor matters in planning are full of danger and financial calamity to groups of school authorities continuing to pursue a policy of careless planning, and indict any architect or school man continuing to disregard the study of the problem of saving space. On the other hand, this reduction in class-room area does not show to advantage when comparing class-room areas with corridor areas, and we must be alive to these facts in our studies of standardization and comparative areas.

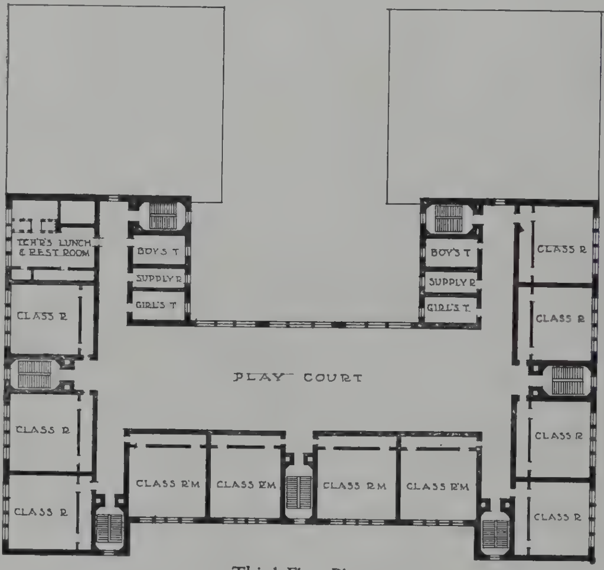
But there is a much more serious problem in the matter of waste space, which has gone unchallenged for decades. It has caused such an alarming waste of money in this country that remedies must be found without further delay before millions of dollars more are thrown away.

This has to do with waste due to stairs and corridors. There are 1,250,000 square feet of floor space in the school buildings of Cleveland devoted to stairs and corridors. This is an area equivalent to 1,560 class rooms, or enough to accommodate 62,400 children, and at the present cost of building in the city of Cleveland it would require $35,000,000 to construct this number of rooms.

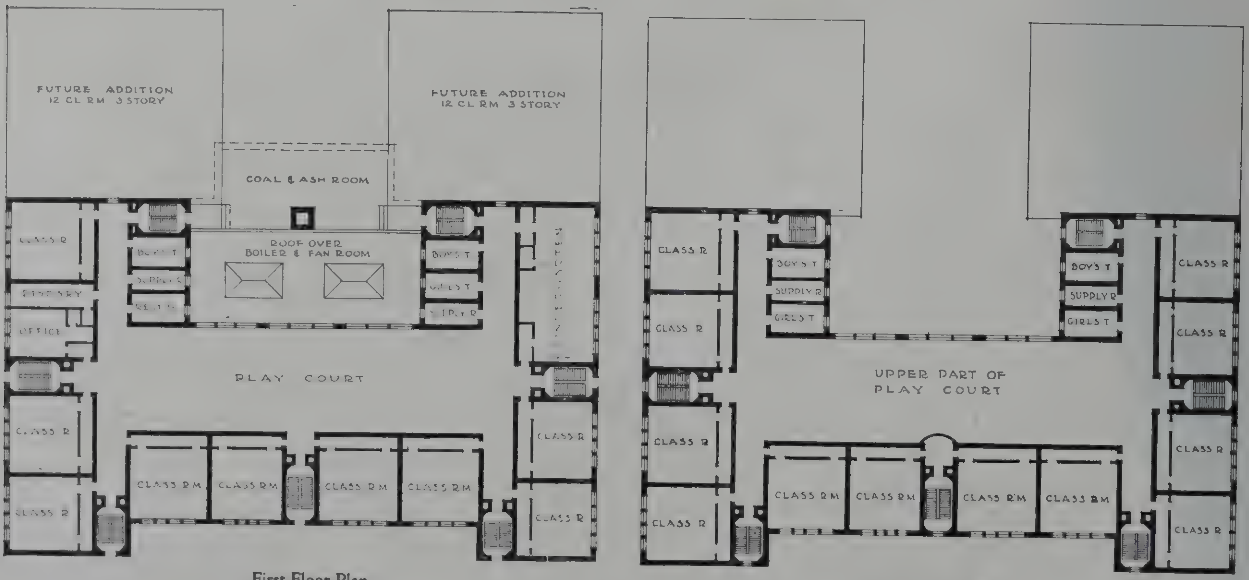
Considering that Cleveland is equal to one one-hundred and twentieth of the population of the country, the space devoted to stairs and corridors in the entire country is equal to 187,200 class rooms, or seating capacity for 7,480,000 children, and the replacement cost would be about $3,744,000,000.

Cleveland has been studying the question of elimination of waste space with the result that three types of plans have been developed.

These types are :



Third Floor Plan



First Floor Plan

Second Floor Plan

Three-Story Corridorless Elementary School with Unit System of Plan and Unit System of Stairs

W. R. McCornack, Architect

1. One-story corridorless elementary school — 10 per cent of the floor area in corridors.

2. Three-story corridorless elementary school — 12 per cent of the floor area in stairs and corridors.

3. Junior High School combination one- and three-story building — 15 per cent of the floor area in stairs and corridors.

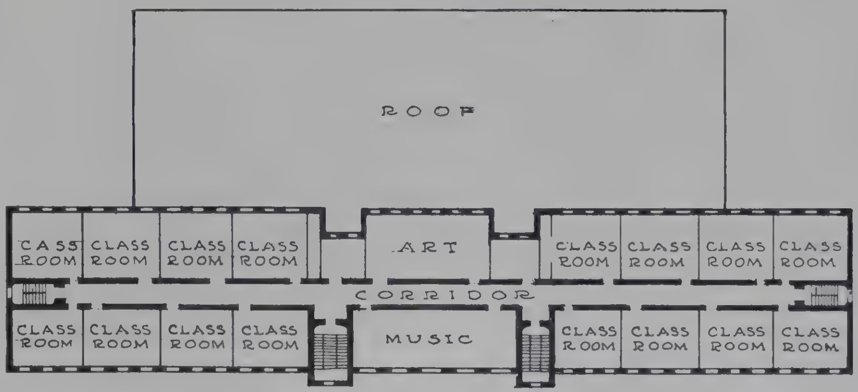
Assuming that 15 per cent is the average amount of waste space in these new types of plans, there is a difference of 10 per cent between the average waste space in the Cleveland schools to-day and the waste space in the proposed new types.

Therefore, 40 per cent of the 1,250,000 square feet of stairs and corridors in the buildings of our present system has been criminally wasted.

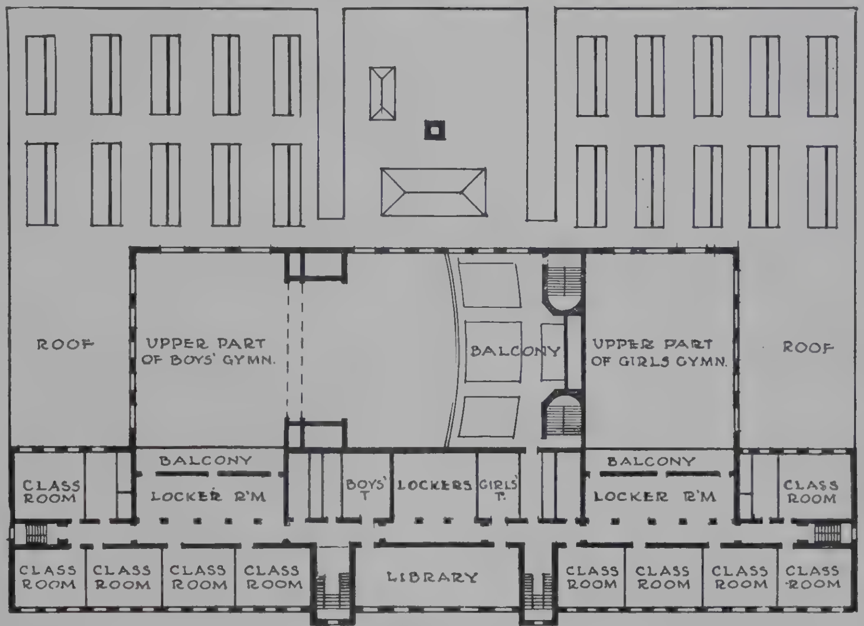
This is equivalent to 625 class rooms, representing seating accommodations for 25,000 children, and these 625 class rooms at the present cost of construction in Cleveland would require $15,000,000 to replace. These 625 class rooms seating 25,000 children represent the actual shortage in Cleveland to-day.

Using the ratio of population of Cleveland to that of the nation, mentioned above, the unnecessary waste in the entire country amounts to 75,000 class rooms, or seating space for 3,000,000 children, and the replacement cost is $1,500,000,000.

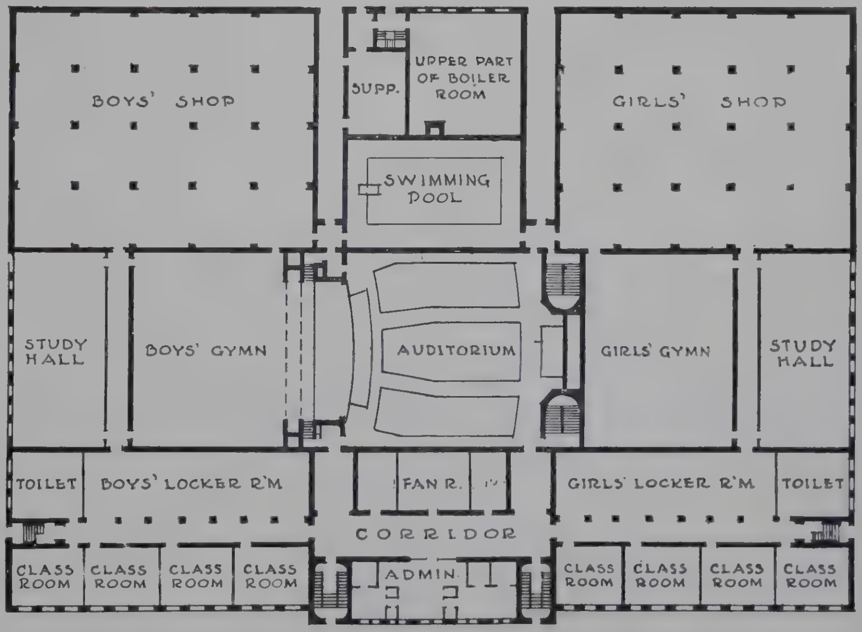
While I believe the figures I have quoted are fair, yet for the sake of making the comparison fairer on account of lower building costs in some sections and possibly less waste in others, let us arbitrarily reduce the waste by 33⅓ per cent, with the result that space equivalent to a seating capacity



Third Floor Plan



Second Floor Plan



First Floor Plan

Combination One- and Three-Story Junior High School. Front Section, Three Stories of Class Rooms; Auditorium and Gymnasium in Center; One-Story Shops in Rear

W. R. McCornack, Architect

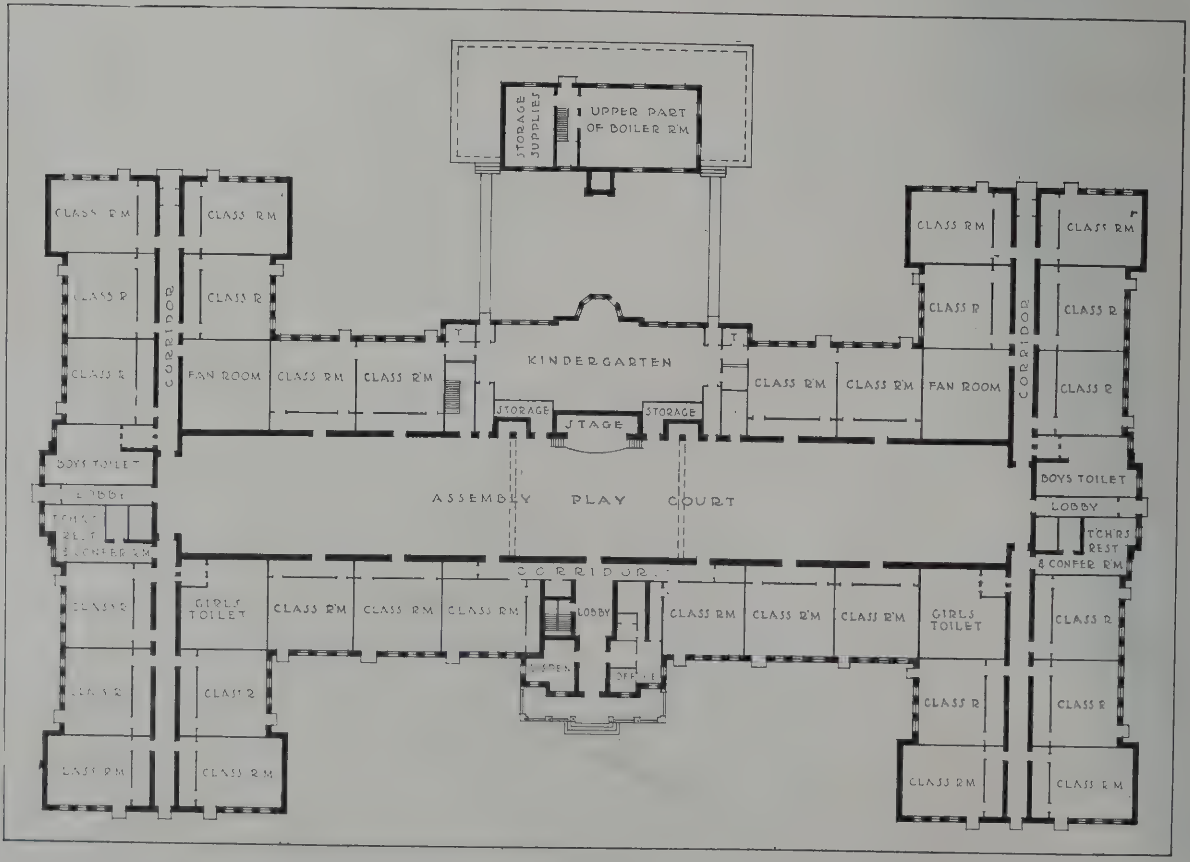
for 2,000,000 children at a replacement value of $1,000,000,000 has been wasted in the schools in this country, while cheaper school buildings have been made necessary, while the children have been denied the refinements in equipment which they should have and the community, buildings of the highest architectural and structural standards. Such architecture produces structures whose cheapness results in a tremendous overhead cost of maintenance, and these results have been brought about by architects who have not thought of buildings as having a financial return on the investment.

This deplorable situation exists because a school building has never shown nor is it probably possible to have it show a financial return on the investment.

Hotels and office buildings require a large amount of stairs, corridors and lobbies, because of the small units, each of which must be reached independently, yet no hotel or office building properly planned shows more than 15 per cent in waste space, and mercantile establishments and factories almost nothing. No architect could survive who planned buildings of this type, which require a definite financial return on the investment, who would plan a building with the excessive amount of waste space existing in our schools. In addition, add to the corridor and stair waste all the basements, oversized rooms, schools used during a small portion of the year, and we have a condition of waste of school funds so stupendous as to be almost beyond belief.

The plans illustrated are a great advance, and we believe that they are merely pointing a way toward a broader and more comprehensive study of school buildings, which shall be more elastic and less wasteful. Let us strive for better architectural service (the lack of which has been the actual cause of this terrible waste), as it is the chief medium through which better conditions can come.

It is time for all school architects and school men to stop and at once inaugurate a policy of intensive study of the school building problem; to reduce its cost without injuring its beauty and its usefulness or construction value, and I believe this study should be concerted and nation-wide, and that a National Bureau for such study is not too visionary a proposal to be idly passed by.



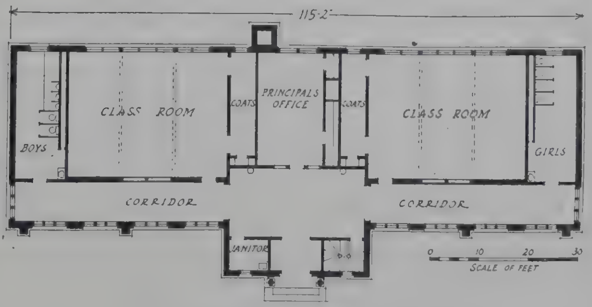
One-Story Corridorless Elementary School with Large Central Play Court. The Auditorium Formed by Double Movable Partitions, Thoroughly Sound-proofed. All Class Rooms Have Separate Outside Exits

W. R. McCornack, Architect

The Whittier School, St. Joseph, Mo.

ECKEL & ALDRICH, ARCHITECTS

A FUNDAMENTAL principle in successful school planning is the provision for future growth of the building. The school illustrated herewith is an interesting example of such planning in the one-story type of school which is rapidly gaining favor in many sections of the country where sufficiently low land values make the scheme practical.



First Floor Plan of Portion Now Built

The first portion of this school to be built constitutes but one-quarter of the complete building, and on this page is shown a detailed first floor plan of the first unit. The central portion is excavated to full depth and contains the boiler room in the basement. The remainder, with the exception of space for a fuel room at the left of the boiler room, is excavated only sufficiently to give a clear space of 3 feet below the floors for the passage of heating ducts and plumbing pipes.

The main walls of the building are of brick resting on concrete foundations. The construction of the boiler and fuel rooms is entirely fireproof, to prevent the spread of fire to other parts of the building. The parts of the first floor not over the boiler room are of wood construction. The roof is framed in wood with shingle covering and tile ridge. It is planned to have a new covering of tile when the remainder of the building is constructed.

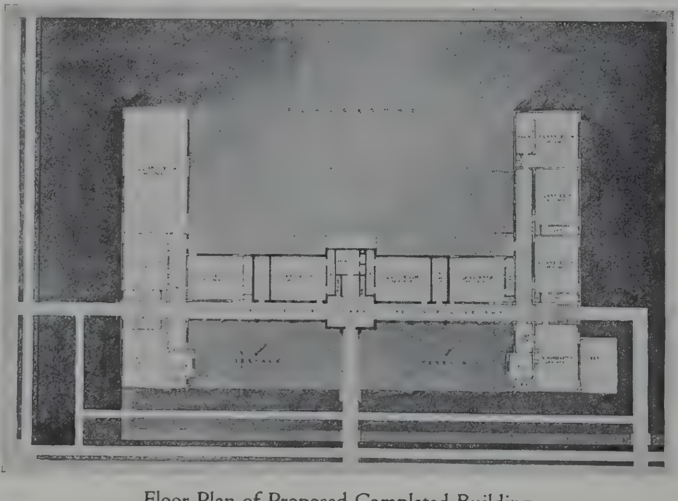
The exterior is of white stucco with the openings and base course trimmed with red-face brick. Just below the eaves is a row of dull green and yellow tiles, outlined with one course of dark-red brick. The woodwork is of cypress and stained brown. The doorway is buff Indiana limestone.

General View of First Portion To Be Built

The building is heated and ventilated with what is generally termed the "split" system. The corridors are supplied by direct steam radiation. Direct radiation is also used on the exposed sides of the class rooms with intakes and outlets for hot air on the room side of the corridor walls.

The corridors have large window openings fitted with casement sashes so that they may be made virtually open-air rooms and are used for play space in inclement weather. Each class room is an independent unit, complete with coat room and teacher's closet. The toilets as built are sufficient to meet the demands of the completed building. The fixtures are set away from the main partition wall a sufficient distance to allow a utility corridor two feet wide behind them, in which vents and pipes are carried.

The completed building will have nine class rooms similar to those now constructed. The rear of the left wing will be devoted to an assembly room and the front of the right wing to the kindergarten unit.



Floor Plan of Proposed Completed Building

Front Elevation of School When Completed

Interior Decoration

SOME DOMESTIC INTERIORS FROM THE WORK OF DELANO & ALDRICH

By HELEN CHURCHILL CANDEE

IF America has a style of her own in architecture it is that classic result loosely called colonial. We come back to it over and over again after wandering in the alluring paths of the Elizabethan, the Italian, the Gothic. It calls to our race. Our early settlers were mainly English colonists, bringing with them English architectural traditions. Our great national ideals, our standards of conduct that the nation upholds, are they not the same that came from England with those colonists on whom rests the honor of having formed this great country? The millions who seek our land to become Americans, do they not find as a dominating influence at the core of our apparently loose politics the strong English rectitude and high ideals which withstand attack?

The architecture of England came to us when we were a colony of England, and it stays with us, even as the moral code stays with us, and both are adopted by the newcomers, no matter what may be the land of their origin. The colonial style is the crystallized racial taste of America formed at a time when our population was less varied.

Certain of our architects feel this to a degree that makes them devote their talent almost exclusively to its use. Among the most eminent of these are Messrs. Delano & Aldrich of New York who adapt the style to the ever-increasing demands of modern life. Comparatively few large houses were built in our colonial days. Perhaps Westover leads in size and beauty. But the demand today is for the large country house. The style adopted by the architects to whom we refer is one that can equally be a delight to the eye in the small cottage and in the home built for the large family with many guests.

The style, as these architects employ it, is one that conveys peace and rest. Long, simple lines, unbroken spaces, an effect of calm, these contribute to peace of mind when the hours come for relaxation within the home.

The way taken to give us such homes is to adhere to the classic tradition and to resist all alluring innovations. An adaptation is not a novelty; it is merely the spelling of a new word with the old letters. It is the building of a home unlike any other with the colonial principles of architecture and detail.

The town house has so many restrictions in the way of space and light that its problems are not easily adjusted. But a study of these illustrations will give an idea of the possibilities of beauty when a man of talent arranges the plan.

The dominant idea is space, to give its semblance even when it does not exist in reality. First comes the subtle matter of proportion. The measure-

Detail of Bookcases and Wall Treatment in Library,
Office of Delano & Aldrich, Architects

ment of the ceiling's height shows how important is a high ceiling to impart a feeling of repose. We are satiated these days with the so-called "cozy" room, over which broods a ceiling almost suffocatingly near. It is but a ruse of the builder, in both house and apartment, to cheapen the building's cost. The mistake of a ceiling which weights the head is never made by Messrs. Delano & Aldrich. Rather, in rooms of their designing, one unconsciously straightens the frame and throws up the head as when under the open sky.

Space is also conveyed, in the examples given, by great simplicity in construction. Whenever possible a wall is left unbroken. Large architectonic features are omitted except where rooms are actually of great size.

As to details of ornament, they are almost invariably small, counting as a line of fretted shadow rather than as a distraction of the attention. It is a clever way of respecting space and yet attaining beauty. Classic ornament lends itself to this happy use. It has the adaptability of a charming woman and fits itself to any position. The old repeats sing the music loved of all the ages since the Greeks invented them — the rounded egg-and-dart, the tongue tip of the palmette, the dentil, the acanthus—just a bit of the latter cut with a niggard's hand from the luxuriant plant — all of these are used as hems to the garment, not as the main feature of the plan.

When a room is to be in the grander manner which still clings to the classicism of Sir Christopher Wren, a heavy pediment is allowed above the door or over-mantel. And then the massive chords of the styles called Georgian are played upon. That designation is ever obtruding itself upon the term colonial, and both are shockingly misused. Everyone knows that our colonial life ended with the entry of the Fourth of July as a national holiday. Yet, as a style, the colonial stretched itself along through the century to include the copies set by the Brothers Adam, for that, too, was but a variant of the Greek in inspiration. Also the elasticity of the term causes it to be stretched over

Wall Paneling in Dining Room and Vista Across Hall, House of Mrs. Willard Straight, New York City

LIBRARY IN WALNUT, HOUSE OF MRS. WILLARD STRAIGHT, NEW YORK CITY
DELANO & ALDRICH, ARCHITECTS

Staircase with Wrought Iron Hand Rail

the inspiring work of l'Enfant in Washington which was erected when the colonies had been a nation for a quarter century.

It was perhaps the Octagon — historic and exquisite — which inspired Delano & Aldrich in the wholly satisfactory entrance hall of circular plan. It is an entrance which at once produces an effect on him who enters. There may be a rabble in the street outside, noise and dust of a city, but the moment that such a hall is entered peace abounds. Thus it gives a benediction and a greeting and sets the mind's mood in a key which produces harmony. This is no imagining; the anteroom of each house we enter is an indication of the spirit that prevails throughout, and these architects give to their houses the effect of quiet elegance, of simple dignity, of an erudite taste, all forecast at the very steps of the wide front door.

A circular entrance hall is a bewitching thing. It is the hub, the center, from which stretch vistas in alluring rays. A domed ceiling is the only appropriate finish to this room of temple-like dignity and purity of style, a dome cut into by the four openings and ornamented with four discs and simple panels outlined with classic motifs. Door openings there must be, and where these would spoil a delicate symmetry they are balanced by a resort to a niche in the wall, framed with a square. The decorative treatment of the niche follows, a Greek amphora within the shelter and a console standing below.

There is ever a charm about a floor laid in marble. This charm becomes a fascination when the central point is a rosette, and around this the blocks of black and white circle in ingenious symmetry. It is just such little surprises as this lively floor in the sobriety of the entrance hall that give individuality and distinction to the best adaptations of the colonial style.

Cool gray walls of the entrance lead naturally to a cement wall on the stairs, and this in most instances is finished to indicate stone, either with blocks merely outlined or with the deeper cutting of the reveal. The stairs themselves are of stone or one of its substitutes, and in them are thrust the iron uprights of the stair rail. This rail is always simple, never attempting the elaboration of the ironwork of Italy or France or Spain. And by this simple, light construction it seems to mount of its own delicate buoyancy. It needs no recourse to sham, it is unaltered as it mounts, as it has had at the start no elaborate elegance too extravagant for upper quarters.

It is a fancy of these architects to place a room halfway up the stairs, a sudden surprise of a room. It is a low-ceiled *albri* of warm shadows, dark woodwork, inviting easy chairs and cushioned sofas. It is a place wherein to smoke and ponder over pleasant matters. Something of the charm of being under the eaves is there, gained by the contrast with the high-ceiled rooms of the floor below and the floor above, for this room is a mezzanine all of itself, tucked in between stories and over the butler's pantry or some such plain utility. In the house planning of today this trick of surprise is generally forgotten. Old houses of luxury have it, those in England and a few here in America. It is a fashion worth reviving.

The living room is the heart of the house. When Delano & Aldrich can light it with clear sunlight they give it character by darkening all the walls from floor to ceiling with walnut in its own rich, neutral brown. The entire wall spaces are made

of alternate square panels and round-topped and recessed book shelves. An ornamental frieze is carved and set to finish the top as a cornice.

All this sounds as though the colonial, the classic, were left behind. But have we not said that it is the part of cleverness to adapt the old to modern uses? A big white room is rarely as "homey" as a darker room, and rows of books never decorate as well in a setting of white. So the living room or library is best finished in dark natural wood. But lest one think the room shows an anachronism in contrast with the house of colonial style, examine the carving of this room to discover the dominant classic note. The Greek key, the beading, the chalice, the zodiac signs are all there.

So often is a so-called colonial dining room an affair of chilliness that Delano & Aldrich avoid its thin attenuation and make it as sumptuous as white can be by employing the grandeur of the Georgian masses. Delicacy is deliberately thrust into the confines of certain rooms appropriate to its fineness, but in the dining room massively framed doors, a mantel broadly proportioned and panel mouldings of size and strength appear in better keeping. The cornice, so slight in other rooms, becomes here an affair of heavy brackets and shadowed mouldings, while door and mantel gain dignity and elegance from forceful pediments. Panel mouldings are studied to thrust the panel forward and to keep the stile in its modest place of retirement. This in itself is a matter too often forgotten, and, in less careful work, the paneled room is merely a flat wall on which are tacked the lengths of moulding which indicate a panel.

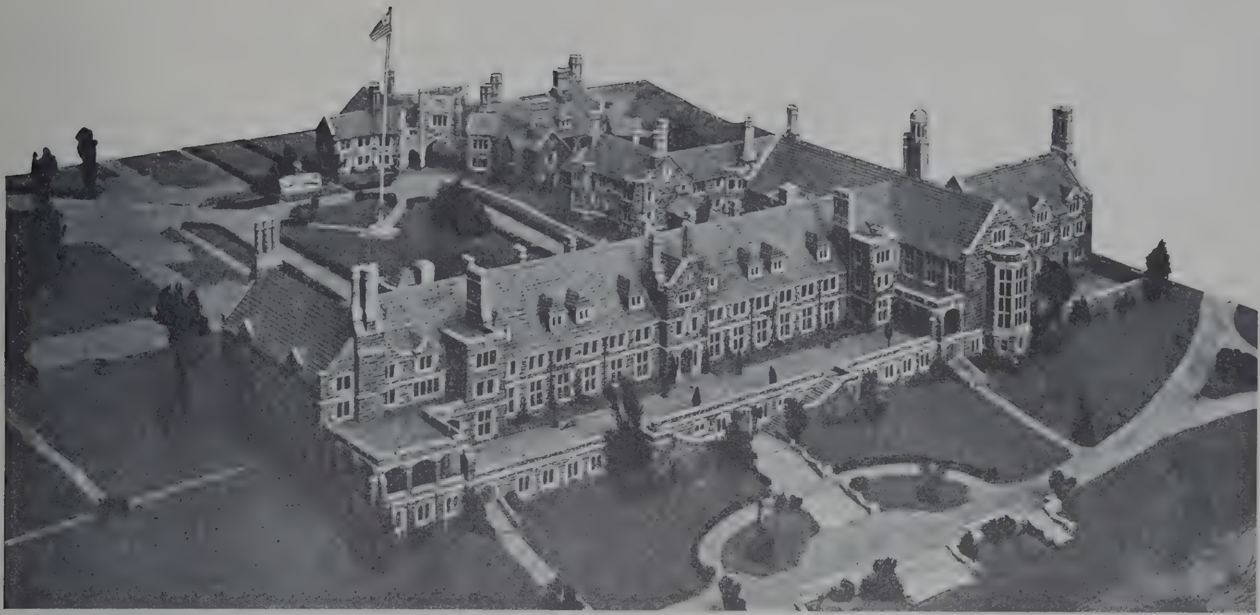
Alexandria, Virginia, in its newest aspect, is a town drunk with industrialism, but under the debris of old grandeur and new smokiness is hidden an old ball room where the ladies from Mount Vernon and the ladies of town and countryside used to dance and courtesy in silken elegance. The atmosphere of that old ball room with its fine carved decorations of dentils and beadings, its musicians' gallery, its suggestions of all the ornamental side of life,—that atmosphere is given by these architects to a modern room for dancing. Fearing lest the late colonial be too thin a style for such large spaces, the usual architect draws on the more voluptuous and highly decorated styles of France. The result is that most private ball rooms look alike. In the planning of the ball room in the Newport house of Mrs. Harry Payne Whitney, Delano & Aldrich dare to show the grace and


Entrance Hall in House of Mrs. Willard Straight, New York City

elegance appropriate to the use of the room. A strongly decorative feature is the fixture for lighting so large a room. Mr. Aldrich of the firm is particularly successful in designing lighting fixtures and he recognizes their importance as a decorative accessory, and thus is absolute harmony maintained. But after all it might seem that the architectural opportunities presented by even the most important city residence are somewhat meagre when compared to the far broader possibilities offered when a country house of equal importance is under consideration. Messrs. Delano & Aldrich are particularly successful in their development of country house architecture and many great houses on Long Island bear eloquent testimony to their skill and discriminating taste. Theirs is an especially happy faculty of interpreting the spirit of the style which they handle so well and adapting it admirably to the work in question. It has already been said that the colonial style is very well adapted to the small cottage, as well as to the house which is the center of an extensive country estate and these architects have been singularly, and possibly equally, successful in both of these somewhat different fields. It might be held that one criterion of the best taste in architecture would be the designing of any building with just the requisite degree of architectural formality.

Through such work as we have been considering are preserved the best traditions of the only style in architecture that is racially American, that is appropriate all over our broad land and that can be always repeated *ad infinitum*, but never, in its purity, *ad nauseam*.

Ballroom in Newport House of Mrs. Harry Payne Whitney
Delano & Aldrich, Architects



Grand Lodge Hall

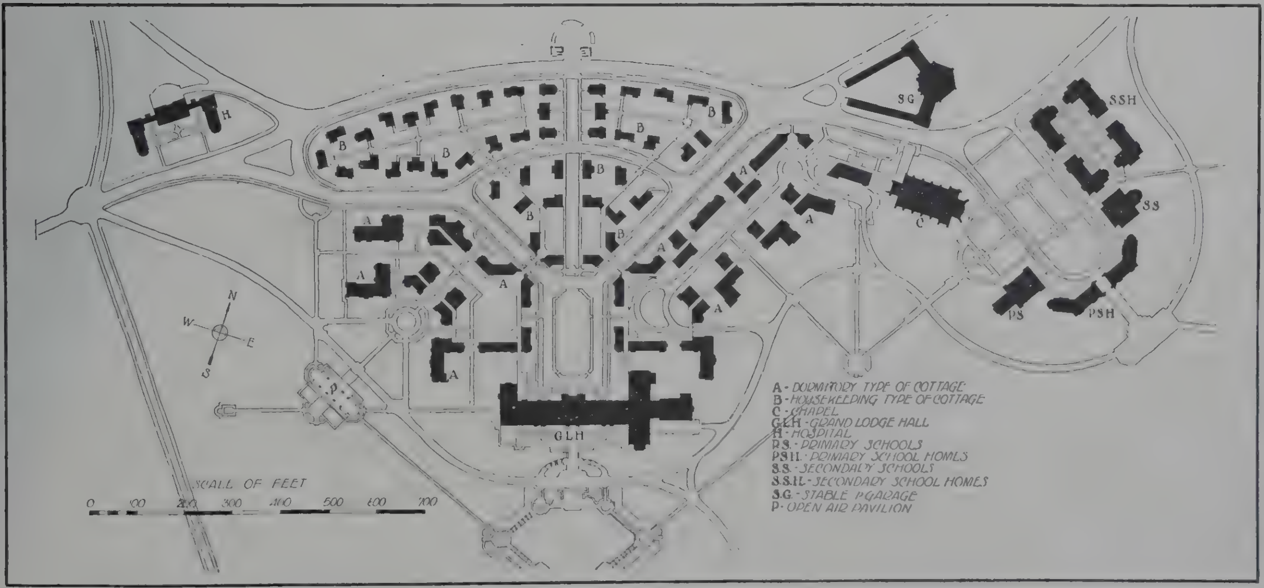
A HOME FOR AGED MEMBERS OF THE MASONIC ORDER IN PENNSYLVANIA

ZANTZINGER, BORIE & MEDARY, ARCHITECTS

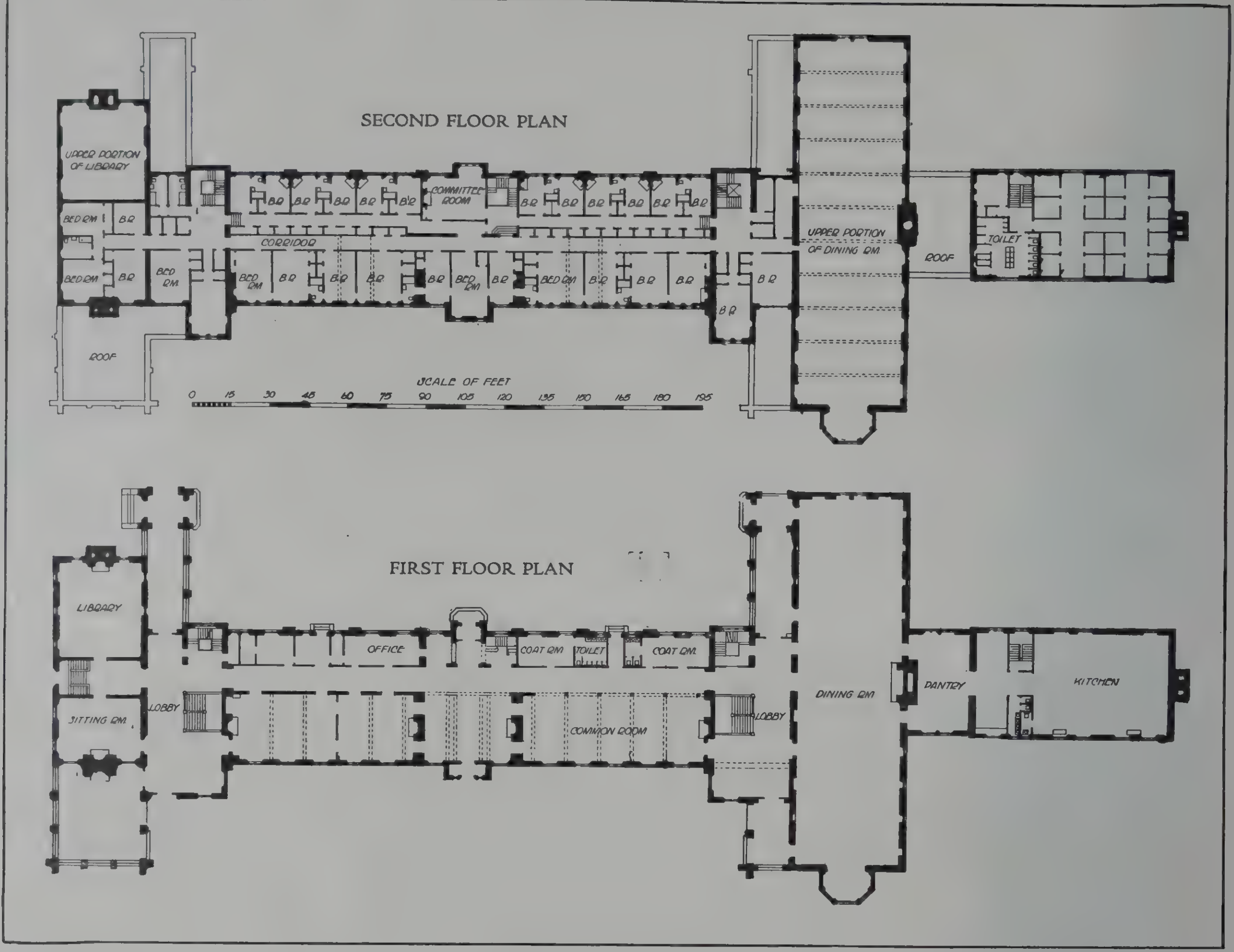
THE plans of the estate of the Masonic Home of the Grand Lodge of Pennsylvania show a highly interesting and very complete development of a great residence, or home, maintained by a large fraternal order. The estate comprises some 981 acres of land in Lancaster county, made up by the purchase of several old farms, upon which many of the original farmhouses are yet standing.

The plans of the architects, Messrs. Zantzinger, Borie & Medary of Philadelphia, call for a grouping, spacious and complete, of all buildings and minor or accessory structures necessary for the comfortable maintenance at present of over one hundred residents and for a much greater number later on,— members of the Masonic order or widows or dependent relatives of members.

The architects seem to have been singularly successful in giving to the Home an atmosphere or appearance which is very rarely found in so large



Plot Plan Showing Complete Development of Masonic Home at Elizabethtown, Pa.



an establishment. The estate is completely lacking in what might be called the "institutional" atmosphere and possesses instead much of the air of a very large and generously appointed country estate where unusual attention has been paid to the working out of the architectural problems.

It has been found desirable to build the more important structures at present, leaving the complete development for a time when building may be more advantageously undertaken. The great area of the ground makes possible an excellent arrangement of a main, or administration, building, surrounded by smaller buildings to be used as dormitories for individuals, small cottages or bungalows for others who may prefer this method of living, and the most attractive arrangement of schools, chapel, gymnasium, hospital, lecture rooms and social or recreation centers and for what might, in a sense, be called public utilities, such as garage, power house, etc. The buildings intended to be used as living quarters are to be connected by a cloister or covered passage with glazed windows, by which each may be reached from the main, or administration, building. The treatment of the hospital building, the structure to be used as stable and garage and the various school buildings seems to call for particular notice. The hospital is placed at some distance from the other buildings of the group and its plan makes possible the flooding of each of the different rooms with sunshine during several hours of the day. The stable and garage is to be provided with shelter sheds which will enclose a parking space large enough to park thirty-five cars, so that a motor, having brought a visitor to any building upon the estate, may be parked in one of the shelters until it is needed. The Home will provide for quite a large number of children of former members of the Masonic order, and the plan here to be followed will provide for the grouping about a school green of a number of cottages in which the children may live and the various school buildings which will be required. It has been found to be better to provide a number of small school buildings, one for each grade, than to have one larger building to accommodate students of different grades. These school and residence structures will be most picturesquely disposed about what will probably be the children's playground.

The main building, Grand Lodge Hall, is now

completed and in use. While it has been planned to be eventually an administration building, it does duty at present as a home for such residents as have already arrived. This building is long and rambling, and though three stories high its unusual size gives it a somewhat low appearance. The walls are of Holmsburg granite trimmed with Indiana limestone, the roofs are of slate, and many stone mullioned windows, boldly projecting dormers and stone chimneys with chimney pots heighten the English feeling of the Tudor architecture in which the buildings are designed. This English character is heightened still further by the long, flagged terrace which extends the full length of the building, closed in at either end by extending wings, beyond which are still other smaller wings and service courtyards enclosed by high walls.

The main entrance to Grand Lodge Hall is from the terrace into the long hallway which extends the entire length of the building. Opening from it are the common room, coat rooms, various offices and sitting rooms, and the office of the Home from which a stairway leads to a steel vault in the basement. At one end this long hall opens into the library, two full stories in height, and into several small card rooms and a sun room, while at the opposite end it leads into the great dining room, a strikingly successful hall about 140 ft. long, 40 ft. wide and two full stories in height, one entire end being taken up with a mullioned bay window. The trusses of the open timber roof are supported on stone corbels; tall mullioned windows are placed just below the roof lines and a paneled wainscot extends about the room at the height of the

View of Grand Lodge Hall Showing Approach to Terrace from Driveway

cornice of the stone mantel. The lighting fixtures of this great dining hall or refectory are of wrought metal of a striking design.

Cold storage rooms are in the basement. The service quarters, such as kitchens, pantries, bakery, freezing room and steward's rooms, occupy one floor of a small wing to themselves, while on the floor above are sleeping rooms and various lavatories for those who work in these departments. Since this structure is intended as a home for members of a fraternal order, many of whom may be of an advanced age, considerable attention has been paid to stairways, — easy of ascent, planned with many landings and placed where a stairway may be quickly reached from any part of the building.

Upon the second floor of this building there are many bedrooms, most of which are so planned that a bath adjoins. Here are also the linen rooms and various domestic departments which belong on a bedroom floor. The upper floor is divided by low partitions into many small cubicles or sleeping rooms.

Grand Hall Lodge, with its wings and accessory buildings, partially surrounds a courtyard or garden in the center of which is the flagpole. All the buildings have been planned so that additions may be made from time to time as circumstances may warrant without disturbing to a great degree any of the existing departments. A spur track from the railroad comes into the grounds, which makes comparatively easy the handling of large quantities of building material or quantities of coal, for it leads to the power house from which heat, etc., for the entire plant is produced. At present only a suggestion may be had of the planting and landscape work which will later add much to the appearance of finished symmetry which is a striking feature of this very important and successful work.

Detail in Corner of Quadrangle

View of Model of Grand Lodge Hall and Adjacent Dormitories, Looking into Quadrangle
(Buildings in immediate foreground removed to show main building)

GENERAL VIEW FROM THE SOUTHEAST

GRAND LODGE HALL, MASONIC HOME, ELIZABETHTOWN, PA.

ZANTZINGER, BORIE & MEDARY, ARCHITECTS

DINING HALL BAY FROM THE SOUTH

LIBRARY WING FROM THE NORTHEAST

GRAND LODGE HALL, MASONIC HOME, ELIZABETHTOWN, PA.

ZANTZINGER, BORIE & MEDARY, ARCHITECTS

SERVICE SIDE OF DINING HALL

GRAND LODGE HALL, MASONIC HOME, ELIZABETHTOWN, PA.

ZANTZINGER, BORIE & MEDARY, ARCHITECTS

INTERIOR DETAILS OF LIBRARY AND DINING HALL

GRAND LODGE HALL, MASONIC HOME, ELIZABETHTOWN, PA.

ZANTZINGER, BORIE & MEDARY, ARCHITECTS

ENTRANCE FRONT FROM THE APPROACH

HOUSE OF REEVE SCHLEY, ESQ., FAR HILLS, N. J.

PEABODY, WILSON & BROWN, ARCHITECTS

COLONNADE ON GARDEN FRONT

HOUSE OF REEVE SCHLEY, ESQ., FAR HILLS, N. J.

PEABODY, WILSON & BROWN, ARCHITECTS

DETAIL OF ENTRANCE PORCH AND COLONNADE

HOUSE OF REEVE SCHLEY, ESQ., FAR HILLS, N. J.

PEABODY, WILSON & BROWN, ARCHITECTS

VIEW OF LIVING ROOM

VIEW OF LIBRARY

HOUSE OF REEVE SCHLEY, ESQ., FAR HILLS, N. J.

PEABODY, WILSON & BROWN, ARCHITECTS

TWO VIEWS OF DINING ROOM

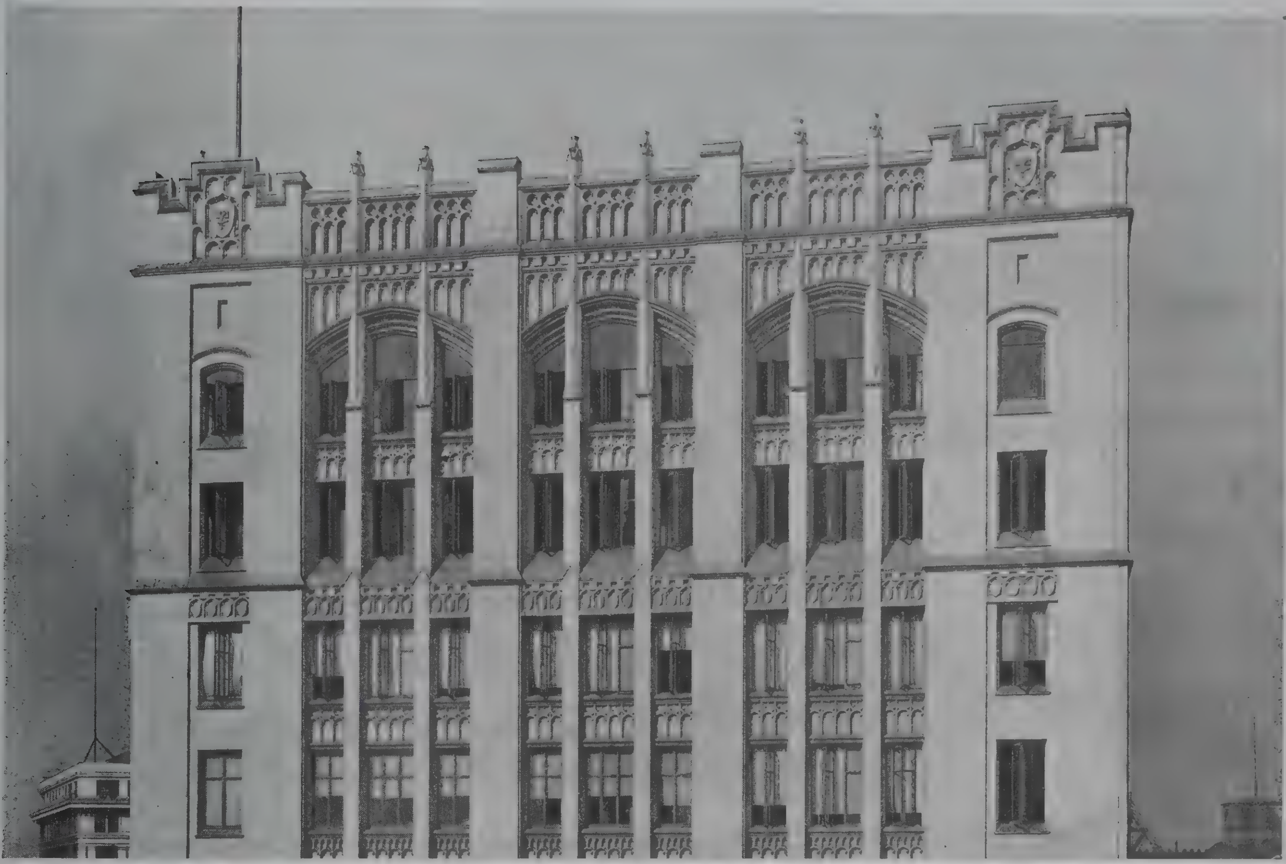
HOUSE OF REEVE SCHLEY, ESQ., FAR HILLS, N. J.

PEABODY, WILSON & BROWN, ARCHITECTS

GENERAL VIEW

FYFE STORE BUILDING, DETROIT, MICH.

SMITH, HINCHMAN & GRYLLS, ARCHITECTS

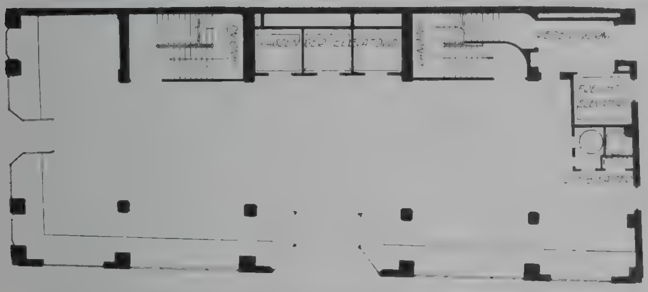


DETAIL OF UPPER STORIES

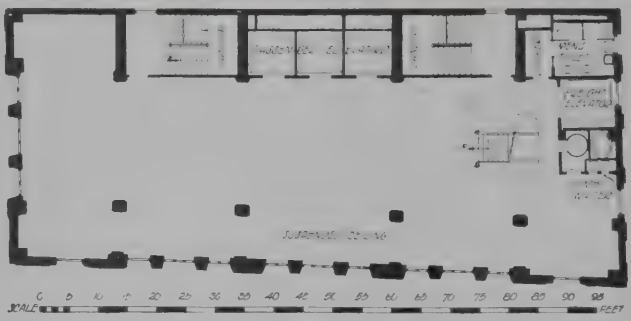
DETAIL OF LOWER STORIES

FYFE STORE BUILDING, DETROIT, MICH.

SMITH, HINCHMAN & GRYLLS, ARCHITECTS



FIRST FLOOR PLAN



TYPICAL FLOOR PLAN

INTERIOR VIEWS OF FOURTH FLOOR

FYFE STORE BUILDING, DETROIT, MICH.

SMITH, HINCHMAN & GRYLLS, ARCHITECTS

GENERAL VIEW OF MAIN FACADE

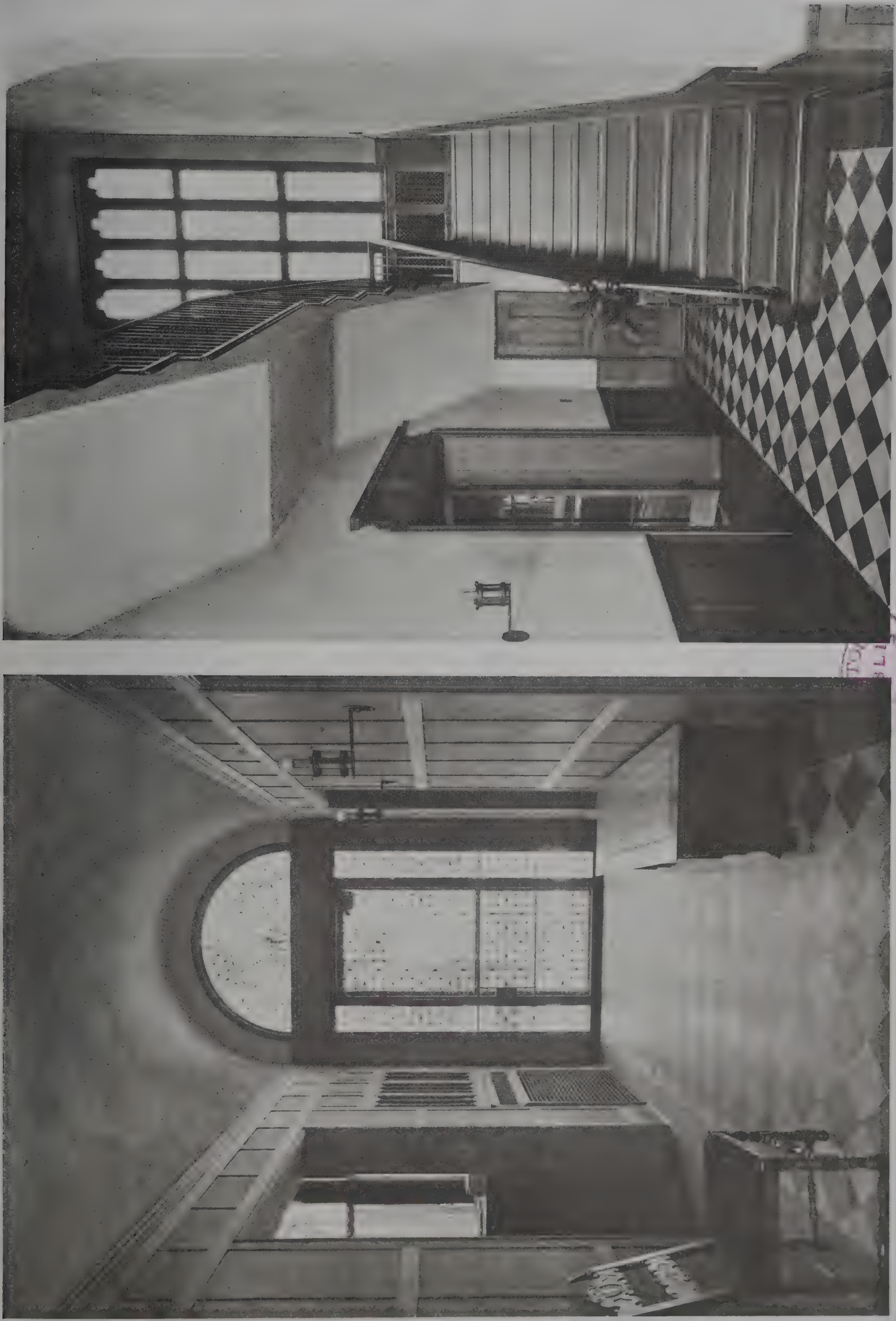
UNDERTAKING ESTABLISHMENT AND MORTUARY CHAPEL, COLUMBUS, OHIO

HOWELL & THOMAS, ARCHITECTS

DETAIL OF STREET FACADE

UNDERTAKING ESTABLISHMENT AND MORTUARY CHAPEL, COLUMBUS, OHIO

HOWELL & THOMAS, ARCHITECTS



DETAILS OF ENTRANCE HALL AND STAIR HALL

UNDERTAKING ESTABLISHMENT AND MORTUARY CHAPEL, COLUMBUS, OHIO

HOWELL & THOMAS, ARCHITECTS

CHANCEL OF THE MAJOR CHAPEL

UNDERTAKING ESTABLISHMENT AND MORTUARY CHAPEL, COLUMBUS, OHIO

HOWELL & THOMAS, ARCHITECTS

A Modern Undertaking Establishment

HOWELL & THOMAS, ARCHITECTS

By HOWARD DWIGHT SMITH

TO find an interesting piece of contemporary architecture in a medium-sized, Middle West town has been likened to chancing upon an oasis in a none too fertile country or to finding an uncharted haven in a storm. The leaven of good architecture is rather sparingly distributed between the Alleghenies and the Rockies. To pioneers the field is interesting. There are many cities and towns in this vast area of the country which are just beginning to feel the thrill of artistic awakening which the metropolitan district must have felt back in those days when the Architectural League was in its infancy — in those years whose activities were so interestingly and vividly described by Mr. Cortissoz in a recent review.

Columbus, Ohio, is one of the cities of the Middle West which needs an artistic and architectural awakening. It is doing the city no injustice to say that at present she is deficient in examples of good architecture. It simply bespeaks a bright future once she does awaken, for she will have the advantage of the experiences of her sister cities of Cleveland, Cincinnati and Akron to lead her on to better things.

It is said that when Pope Nicholas V began his great work of reëstablishing the Church in Rome in the thirteenth century, he placed great reliance upon the theory that the temporal power of the Church would be greatly increased and maintained by making Rome a city of great architectural splendor. It is largely because of the magnificence of the structures erected during his time and in the centuries immediately following that we know and study and revere their monuments and the sentiments of that age. The average Middle Western town or city has no sentiment crystallized along any such lines, and, however far advanced it may be commercially or otherwise, it leaves a great deal to be desired artistically. And the term "artistically" is used in a serious and practical sense and not as a "pink tea" term of the so-called *intelligencia*. So it is a pleasant and gratifying surprise to find such an example of architecture as the Mortuary Chapel for the Schoedinger Co., Funeral Directors, at Columbus, as evidence of a little leaven in a large loaf.

In Columbus, as in most towns and cities which have experienced indiscriminate expansion, business zones are encroaching on residence districts in one direction or another. It has always been thus

General View of the Major Chapel

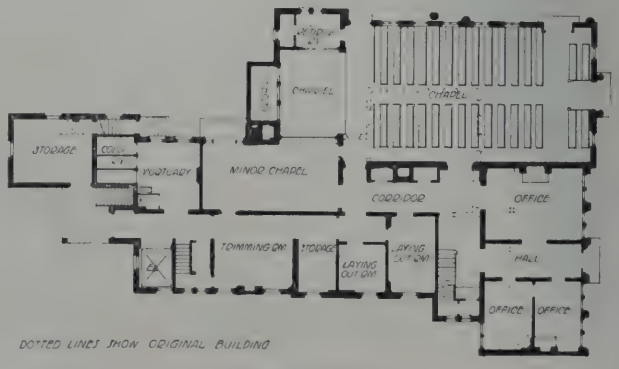
View of the Minor Chapel

with our more or less haphazard methods of town planning. The encroachment has taken many forms, but it is nevertheless common to most growing cities. In such cases there are invariably problems presented which involve the use or adaptation of existing residential structures to new purposes. Such a problem was the Schoedinger Chapel. Ordinarily such commissions are not considered great architectural opportunities by the profession. Some notable examples of contemporary architecture bear evidence of the fact that it cannot always be predicted where or when the so-called architectural opportunities will crop out. The transformations wrought on the façades of some of the upper Fifth avenue residences are of this class. The alteration of the Edson Bradley residence in Washington by Mr. Howard Greenley, transforming a dry monstrosity of the early 80's into a chateau which rivals some of the real structures of the late French Gothic period, is another of this class. The Italian-like residence of the late John R. McLean, by Mr. Pope, began in his office as a more or less unimportant residence alteration. The success of the Schoedinger establishment warrants its classification with these notable alterations which we have just mentioned.

The plan sheets of the set of contract drawings show the usual double group of contrasting symbols for the representation of existing and new work. But the art of dressing up an alteration with a new front has been practised here with consummate skill. It is with results such as these that the architect justifies his connection with business structures. Business men as a rule to-day only employ the architect when it means dollars and cents to them so to do. It takes a good business man no time to realize that an architect as a superintendent of construction is an asset and that his commission is money well invested. But few of them realize that in their business buildings the intimate study of fundamental problems of plan and elevation is a dollars and cents investment. He realizes that artistic merit in public buildings is a matter of civic pride, and he realizes that his home is not a commercial proposition and that artistic merit in it is much to be desired. But the business man is coming more to realize that there is a certain money value in the artistic appeal which a building makes to the layman, to the public from whence he draws his customers and upon whom depends his business. The results obtained in this instance reflect credit not any more upon the ability of the architects than on the good judgment and business acumen of the owners of the building.

The problems involved in the design of a mortuary chapel and an undertaking establishment are not often met. Such a building presents a rather peculiar and unique proposition. As a part of the equipment of an undertaking establishment a mortuary chapel is highly desirable, if not quite essential. The chapel is a feature which of necessity

Second Floor Plan



First Floor Plan

Private Reception Room

must not be entirely devoid of a certain amount of sentiment. This need not be discussed at length here, but it is an interesting sidelight upon the relationship between architecture and our social habits and customs. The services held in a mortuary chapel have a certain sanctity, and it is quite fitting that such services, in spite of the sanctity of their nature, should be held in a place less frequented than a modern church. Memories of the incidents and experiences of a funeral service are perhaps less often recalled if they are disassociated from a regularly attended church edifice.

The problem here presented has been solved more strikingly in the new exterior dress which has been put upon the old residences than in any other way. A close analysis of the plan, however, will show that the appeal made by the exterior is very largely the result of logical and successful planning. The expression of the chapel element of the building by the high, simple, nave-like, ecclesiastical mass, with its large plain doorway, rose window and belfry, is supported by the suggestion of an adjoining cloister within which the business offices of the establishment are housed. This adaptation of an interesting north Italian style whose historical associations are largely ecclesiastical is quite appropriate and commendable. The extensive use of brick for architectural detail may have been practised as a measure of economy, but even if so, its simplicity and good proportion are quite acceptable and surely in keeping with the spirit of the style which this building emulates. Such details as the arches of the porte-cochère, where there is an apparent disregard for structural propriety, make the building an interesting study in architectural archeology; for what Italian constructor of the thirteenth or fourteenth century would have hesitated a moment about doing just such a thing as is shown here, where tie rods perform a natural though somewhat illogical function. With reference to plan arrangement, it might be mentioned that this porte-cochère not only forms a protection for the carriage entrance to the chapel, but is a part of the passageway to the garage, which is an important part of the building group in which are housed the motor hearses, limousines, etc.

Of the plan little comment is needed. The placing of the units so that the major chapel is easily accessible from the street, from the porte-

View of Principal Business Office

cochère, from the business offices and from the mortuary and laying-out rooms is a feature of careful planning well worth notice. The major chapel has a seating capacity and is adjoined by a minor chapel seating thirty. It is interesting to note a unique feature in the folding wood panel windows between the minor chapel and the chancel of the major chapel. This has been used quite frequently in the case of public funerals when the immediate family may occupy the minor chapel in complete privacy and still be quite close to the chancel and the services in the major chapel.

In the major chapel the plain, sand-finished walls form an effective foil for the elaborately painted beamed ceiling and the highly ornamented walls of the chancel. The center portion of the decorated panels at the rear of the chancel form a screen behind which is located a pipe organ for use in the chapel. The appointments of the business offices, particularly the two smaller ones, are quite in keeping with the high character of the building.

The most commercial aspect of the building is found in the huge robe and casket display room on the second floor. This room occupies the entire area of the building over the major chapel. Its wall cabinets, extending entirely around the room, form a wainscot feature from which the elliptical barrel-vaulted plaster ceiling springs. The extremely commercial character of the room is relieved by the pairs of high-backed seats which have been devised to cover the huge radiators which occupy conspicuous places on the floor. On the second floor also there is a suite of rooms, where, in cases of emergency, out-of-town relatives may be lodged as at a hotel. This has proven at times a feature of great convenience.

The wood used in the major chapel is oak, as also in the large office and the halls. In the small offices on the first floor, and the display room on the second floor, the wood used is selected birch which has been given a dull polished wax finish over a gray-brown stain. The minor chapel and all the smaller rooms of the building have enameled finish. All walls and ceilings in general are rough sand-finish plaster. The floors of the main office and the halls are of black and white alternating diagonal square tiles. The aisles of the major chapel and the entire floor of the display room are of cork tiles, while the rest of the floors throughout the building are oak, except in the lavatories, baths and mortuary, which are vitrified tile. The materials used throughout the entire building bear close inspection and bespeak the good judgment of the business men who have encouraged and supported their architects in the production of a building which is not only a credit to the architects but a source of satisfaction and a good investment for its owners.

Robe and Casket Display Room, Undertaking Establishment of Schoedinger Co., Columbus, O.
Howell & Thomas, Architects

ARCHITECTURAL & BUILDING ECONOMICS DEPARTMENT

C. STANLEY TAYLOR, *Associate Editor*

General Business Conditions as They Reflect on the Building Situation

WE are at a time now of unusual conditions in the business world when it benefits the architect, the builder and all others interested in construction matters to give heed to changing economic conditions and to the greater aspects of the commercial, industrial and financial fields as they may affect the building industry.

A comprehensive survey of the business world shows many points of interest and to a certain extent offers many possibilities for coping with situations which are wholly different from those prevailing before the war. It is apparent that the first wave of prosperity is broken and that we are now on a decline. We know that in considering the volume of industrial earnings in the past three years the promise of the future is not as bright as it has been, even though the gross earnings in 1919 were greater than ever before. In 1917 a higher net profit was shown in spite of the fact that gross earnings were not as great as in 1918 and 1919. The result of this condition has been an increasing demand for production, and as production has meant financing, heavy expansion has taken place, and a vast amount of money has been invested in industrial securities and refinancing projects.

The peak of high prices in most lines is apparently passed, and there is a definite tendency now to bring down prices. The public is now recovering rapidly from its orgy of extravagant expenditure and wild investment, and as a result there is a noticeable tightening in the amount of investment in propositions offering extravagant profit and in the production of luxuries. During the past few months while a great volume of money has been put into necessary building, this has been largely investment of necessity and under duress rather than investment for conservative return.

It is an amazing but understandable fact that any wave of commercial prosperity is usually followed by an equal area of depression. Thus when we know that the unexampled prosperity of the last few years has climbed to a peak and is definitely started on a line of descent, we may be certain that the ensuing period will be one of gradually returning conservatism, both in financial activity and in actual commercial profits, even to the point of reaching a fairly serious business depression.

An equally amazing fact, however, and one of direct interest to the building industry, is that the building industry is the last to benefit by national prosperity and incidentally is by far the last to be adversely affected as the line of industrial and commercial profit decreases. In fact, it would seem on logical analysis that as popular interest in wildcat investment and in various other investments entailing high profits may lessen, so must interest return in conservative investment; and conservative investment may well be translated to mean investment in those forms of production which meet pressing economic needs without undue profit.

There are, as shown in the past, three methods of "holding on to money" on the part of the public when it has been overcome by a wave of conservatism equal to a former wave of extravagance. The first is to put the money into the bank; the second is to cautiously put some of it into sound bonds and low-return investments which offer security and somewhat better than savings-bank interest; and the third is to put money into income-paying real estate.

We have passed the great wave of industrial expansion with its accompanying extravagance; an era of speculation in stocks and unimproved real estate — a time when the subdivider and allotment developer can sell lots as fast as he can map them. We have passed the time of feverish speculation in the increment in values of existing buildings due to the great increase of reproduction costs. We are passing now through a period when savings banks are reporting greater deposits than ever before in the history of the country. As we watch the fluctuating bond market we see that the period of depression is showing signs of breaking, and that the return of the public to a normal speculative basis is obvious. What is more logical to believe than that the third step — that of a return of public confidence in building investment — may be expected soon?

Therefore, those of us in the building industry who may begin to hear comments, even of a slightly discouraging nature, can take heart in that the silver lining of the cloud of decreasing prosperity usually falls to the building industry, and it may be that the line of prosperity for the building industry in general runs somewhat inversely to that of the average industrial interests.

Co-operative Ownership to Meet the Present Shortage of Buildings

I. STANDARDS AND PRACTICE DEVELOPED FROM PAST EXPERIENCE

THE trend in real estate and building activity in the United States to-day is significant in view of the fact that much of this activity is being forced by economic causes into new and practically unused channels. Viewed from a broader aspect, we may consider the increasing demand not only for housing but for rentable building space of all kinds almost as a great volume of water rushing down a natural channel. Suddenly the usual channel has been dammed by a structure, the principal units of which may be considered the high cost of producing building materials, the difficulty of transporting building materials, the high cost of labor in assembling these materials, and the resultant unwillingness of the ordinary financing organizations to provide the necessary funds for building loans and mortgage loans which are necessary in great volume to meet the building demand. As a result, this demand has assumed the proportions of a flood and is naturally seeking new channels.

New Methods of Financing

Thus we find for purposes of financing buildings a great number of new financing corporations which have realized wisely that the only place to get money to meet a public need is from the public. Consequently these corporations have been organized for the purpose of financing both first-mortgage building loans and for partial equity financing, selling to the public so-called first-mortgage gold bonds paying 6 per cent and using this money to make necessary first-mortgage loans; while, for equity financing, actual stock in the companies is sold to numerous small investors. The proceeds of these stock sales are used, as before stated, in partial equity financing, which means that land contracts are discounted; that, in addition to first-mortgage loans, builders are provided with practically all of the necessary funds for carrying out building operations, for which they pay a premium approximating from 15 to 20 per cent of the entire cost of labor and material.

This heavy tax on financing is bearable only where the need is greatest, and that is in the construction of dwellings. Thus we find in the larger cities of the Middle West great sums of money being raised and expended for housing. The tenant or purchaser of the house has been educated to unusual costs and apparently is not discouraged by the additional cost of this type of financing. It would, therefore, seem that this new development in the financing of building operations in the dwelling fields is the most practical solution yet devised for meeting the general housing shortage.

It is but natural, therefore, that in consideration of the heavy cost of materials and labor to which an unusually severe tax is added for financing, that the individuals who actually wish to use the building space thus provided should begin to think along lines which might lead to the provision of the necessary space without paying so much to the wholesaler and the jobber, who in the case of a building operation consists of the speculative builder, the building financier and the building investor.

Principles of Co-operative Ownership

We arrive, then, by a process of natural reasoning to a realization of the application of co-operative ownership, which means simply that instead of a group of unconnected individuals renting portions of a building, a group of persons wishing building space of a certain kind are brought together to pay in rent for an advanced period, thus providing funds to build, and eliminating the speculative and financing profit. The rents which the group of unconnected individuals must pay in a new building are computed to include returns, not only on the high present cost of construction and maintenance, but on the high cost of financing and on an element of profiteering which has been definitely introduced into the speculative real estate field in the last two years.

We may take, for example, the wild speculation in apartment houses which has been carried on in New York City. Here apartment houses have been purchased originally on a basis of six or seven times the annual rental. Immediately rents were raised and the building resold to another speculator or investor. In many cases buildings have been sold seven or eight times in a few months, and the tenants have been forced to pay rents which have been increased sometimes as high as three times the rentals paid during the pre-war period. It is evident that if the first purchaser had been a group of individuals interested in living in the building they could have realized a great saving on rental cost.

As usual, a realization of this possibility has come to the public somewhat too late in New York City; but it is interesting to note that hundreds of existing buildings have recently been placed on the market for sale under a co-operative plan, whereby a tenant purchases his apartment outright, and the building is operated under the usual co-operative

methods as described in later paragraphs. This example may be used to describe one of the unusual channels into which real estate activity is turning; but the more interesting channel of the co-operative building and ownership of new structures constitutes a subject which is worthy of careful consideration on the part of architects, builders and prospective renters of building space of every description.

Large Projects on Co-operative Basis

There can be little doubt that a great volume of building is to be carried out in the next few years on the co-operative ownership basis. As this article is being written information comes from New York that the co-operative method of building has made possible the greatest single real estate transaction ever known in that city. This project involves an expenditure of more than $40,000,000, consisting of an estimated construction cost of $25,000,000 and a 21-year lease of land at a rental of about $15,000,000 with two renewals. A syndicate has been formed including several prominent builders, for the purpose of leasing the two blocks between Park and Vanderbilt avenues from 45th to 47th streets (part of the Grand Central Terminal zone) and constructing thereon two office buildings, one a 31-story building and the other a 25-story building. These buildings will have a total floor area of over 1,500,000 square feet. The entire project is being developed on the co-operative basis, whereby a number of large corporations are taking extensive space through the purchase of stock in the operation.

In various parts of the country new apartment buildings and office buildings are being developed on this co-operative basis, and further analysis will show sound reasoning in the production of the great volume of business to be developed in this manner.

When we reach a condition in the building field such as that which obtains to-day, high cost of building, coupled with the difficulty of financing, eliminates to a great extent the activities of the speculative builder and the realty investor. Thus, if building space is to be provided, we must look to new sources of building funds, and what sources could be more logical than those individuals or corporations for whom the actual use of the new building space is to be provided?

The general principles of co-operative building ownership apply not only to apartment houses but to groups of individual dwellings, to office buildings, loft buildings and all forms of rentable space for which there exists a popular or general demand. We can, therefore, analyze co-operative building ownership in its application to apartment buildings and from this analysis gain the desired information regarding similar financing of other types of buildings.

Application to Apartment Houses

The co-operative ownership of apartment buildings is not a new idea. In fact, it originated long ago in European countries and became particularly popular in Germany and in France. At sporadic intervals co-operative building was attempted in this country; but in the early years of this activity it usually failed because of the lack of proper organization and because the operation was based too strongly on congeniality and the human equation. Gradually, however, apartment buildings were developed, particularly in New York City, so that during the last two decades hundreds of such buildings were built and financed and have been successfully operated to such an extent that they have caused little comment, until at this time of increased interest in the co-operative idea a more careful analysis of what has gone before is being developed. We can, therefore, for the purpose of analyzing this question of copartnership building in its application to present-day conditions, benefit considerably by a study of experiments of the past, and of certain standards which have been developed as the result of successful experimentation, while warnings will be sounded as we may meet conditions which in the past tended toward failure.

On investigation we find that forty or fifty years ago apartment buildings, particularly of the studio type, were developed in New York City and have been operated successfully on the co-operative basis ever since, one building being of particular interest in that it still has tenants who were original purchasers in the stock of the building. The principle of co-operative ownership has been described by an organization which entered this field many years ago in the following manner:

"A man buys a double house paying about one-third the price in cash and leaving the balance on mortgage. He lives in one-half of the property and rents the other half, and the income from the rented half pays the interest on the mortgage, taxes, insurance and all the other expenses of the whole. Thus he gets rent free in the place he lives in."

This in a sense is the essence of the plan. In applying this plan to an apartment building it is evident that this idea must be developed in view of a number of additional and contributing factors. In the first place there must be an association of individual owners who provide the necessary financing to meet the equity cost of the building. Space in the building is provided for these owners,

but additional space must be provided for renting purposes in order that the income from the rented section of the building will meet the ordinary running expenses, leaving the owners' rent free.

Details of Typical Operation

Thus, a group of individuals may form a stock company and purchase enough land for a building. They obtain a building on permanent mortgage, making it unnecessary for them to put up in cash more than 40 per cent of the cost of the operation. When the building is completed each of the stockholders owns jointly with his associates the equity in the building. Each is his own landlord, as his ownership carries the right to the occupancy of a certain number of square feet in the building, this apartment being under a perpetual proprietary lease. As long as the rentable space is properly balanced to carry the cost of running the building, the co-operative owner is not called upon to pay any rent on his apartment unless there is a deficiency in the income from the rented part of the building. If there is a deficiency, this is, of course, chargeable as an owner's rent.

It has been generally experienced in successfully operated co-operative apartment buildings that a surplus accumulates from the income of the rented space which has been used to gradually decrease mortgages. It is a significant fact that may be noted here, that there has been to the writer's knowledge only one foreclosure of mortgage on any co-operative building in New York.

The co-operative owner has an apartment designed to meet his individual needs, and he often has more floor space and a more conveniently appointed home than if he spent an equal amount of money in purchasing an individual dwelling, particularly in expensive residential areas. He also avoids the direct responsibility of utilitarian management, and at the same time by the investment of a sum of money enjoys freedom from rent, taxes and the other costs incident to the direct ownership of an individual property.

Referring to brief figures on the average co-operative apartment building which has been successful in New York, let us take, for instance, one building in which the cost of land and building was $1,000,000, and we find the plan has worked out as follows :

Cost of land and building, say	$1,000,000
Mortgage, at 5 per cent	600,000
Equity	$400,000

Represented by 4,000 shares par value of $100.

The building contains 12 suites of duplex studio apartments of 10 rooms each, with 3 baths ; 24 suites of 4 rooms and bath ; 12 single-story studios, with anteroom and toilet, and a large picture gallery.

The income would be approximately as follows :

12 duplex suites at $6,000	$72,000
24 small suites at $1,750	42,000
12 single studios at $1,000	12,000
Gross income	$126,000

Fixed charges and running expenses :

Interest	$30,000	
Taxes, say	12,000	
Expense account	8,400	$50,400
Net income		$75,600

So that ten subscribers having taken the $400,000 of stock in equal shares, and each occupying his duplex apartment, gets rent, heat and water supply free, and a surplus of $75,600 is turned into the sinking fund to help toward paying off the mortgage.

Three Methods of Financing

The method of carrying out a co-operative ownership project as described above is one of three methods, all of which have proven more or less successful in the past.

I. The formation of a stock company to provide the necessary equity. This is the plan heretofore described in which about 40 per cent of the building space was occupied by owners and 60 per cent made available for renting purposes, the rental income being used to defray expenses on the entire building.

II. Another plan which has been used successfully for the development of small buildings has been what is called the straight co-operative building ownership. In this plan a stock company is formed and the entire space is occupied by owners. For instance, if 10 individuals formed a stock company, a building was built containing 10 apartments, and the actual ownership of each apartment was vested in an individual who contributed to the purchase of stock. This plan had the advantage of a less involved financing operation, and the building was operated by a committee of tenants. Each apartment owner paid an annual owner's rent of an amount so figured that the total rental would equal the approximate renting cost. At the end of a year a deficiency payment was required or a rebate given, depending on whether or not the cost of maintenance overran the total of owners' rentals. This is a simple plan which has proven successful in bringing all the benefits of ownership to the individual apartment tenant.

III. A third plan which has been successfully used is a combination of the two plans above outlined. This involves the formation of a stock company, the provision of rentable space, but also charges an equal rent to the apartment owner. At the end of each year's operation the profits of the building were divided and rebated in cash to the stockholders, thus accomplishing in effect the

same condition as in the first plan discussed.

A further development of this plan was to charge the market rental on the rentable space and to charge owner's rental (usually estimated at one-third the market rate) on each apartment owned by a stockholder under perpetual lease. Thus sufficient funds were collected to insure always the deficiency payment, and the surplus has been used for reducing the amount of mortgage.

A Banker's Opinion of the Plan

Some years ago, when interest was somewhat keen in the co-operative apartment idea, an experienced banker was asked his opinion of co-operative stock and building ownership. Following is his statement:

"There have been owners who in some cases were under the delusion that they would get 'something for nothing' and others who did not apply ordinary judgment to the choice of their investments. These have met with disappointment. On the other hand, a large number of families are now living in co-operative buildings in New York owning their homes, and effecting very satisfactory economies in the item of rent.

"The best results are attained when the owner of an apartment actually lives in it. For when he fills it with an outside tenant he is reducing the possible income of the building as a whole, and maybe the direct cause of a vacancy among the apartments of the building which were intended for renting to the public.

"It sometimes becomes necessary, however, for an owner to rent his apartment. There are such cases where the owner has averaged a net cash yield on his investment, during a period of from three to twenty-five years, or from 7 per cent to 17 per cent.

"A skilful investor raises the following question when an offering is made to him:

"1. Is there ample security behind the investment?

"2. Is the yield high enough; is there a fair return on the money invested?

"3. Has the investment marketability; that is, can it be sold at a reasonable price in case of necessity?

"An investor who has in mind the 'fourth dimension of investing,' asks also —

"4. Has it the possibility of enhancement in value?

"Now, when you, as a small capitalist, are invited to buy an apartment in a co-operative building you should satisfy yourself on these four points, and, as we shall see, on one other.

"1. You must be sure that you are buying a really valuable share of the equity in the building. If the co-operative company has paid to its promoters an exorbitant fee; if the land has been purchased or is to be purchased at a price fixed by the seller and not by the law of supply and demand; if the building contract is to be let on a non-competitive basis, then it is likely that the equity, when thoroughly analyzed, will turn out to be startlingly small.

"2. The return on the investment should be estimated on a rainy Friday when your health is bad. Make an allowance for empty apartments, repairs, interest, bad debts, etc., which is in accord with the experience of real estate brokers skilled in apartment work. See that there are in the co-operative group the makings of a competent and hard-working house committee, and that the real estate agents for the building know how to manage as well as rent an apartment building. Be sure that the articles of incorporation and the entire business plan are approved by a lawyer thoroughly familiar with such properties. Satisfy yourself that the architect is an expert in utilizing space in a city apartment. Inquire the annual expenses you may be under, whether they are called assessments, proprietary rentals or plain rent. Be careful not to buy an apartment twice or three times as desirable as the one that you now, on the same income, can afford to live in.

"3. If you can show an attractive statement of the profits of your apartment when rented, you should be able to sell it at a fair price. But such an investment, however good, should be classed among your 'slow' investments. The writer's opinion is that when the desirability of co-operative apartments is better understood they will command a satisfactory market. There have been numerous cases where owners have sold at a profit.

"4. 'The fourth dimension of investing' applied to this problem would take this form: If the apartment property is to enhance in value it should be located where the rising tide of realty values will lift it to new levels. Here is where your real estate brokers, if experienced, can be of great service. Your own study of the trend of residence sections may also throw light on the subject. It is sometimes advisable to call in one of the great realty consultants on the case.

"The architect, if he has professional skill, may also look to the future by designing the building in such a way that it may later be used, in case the neighborhood changes, for commercial purposes.

"There is a fifth consideration of great importance—the personnel of your prospective associates in a co-operative apartment. You are making an important investment and choosing a city residence for a long period of years. You are also virtually going into partnership with the group of co-

operative owners. It is of vital importance that, besides having business ability, they should speak the same language. With this point properly covered and the other four tests of a good investment applied, you should be able to make a wise choice of a co-operative apartment. And if you do, you will have disposed for yourself and your family of the largest item in the cost-of-living problem."

Does Not Give "Something for Nothing"

Too much stress cannot be laid on the point made in the above commentary relative to getting "something for nothing." While the average co-operative plan is featured as a rent-free proposition and is in effect rent free, it must be realized that a considerable cash investment has been made, and that the interest on this investment is chargeable as rent. The actual effect of such an investment is that of obtaining attractive living quarters at a very low rental. At the same time it has been possible for individuals to choose their neighbors, in view of the fact that the original group of investors must naturally have been of a congenial nature, and that in the average co-operative project of past years agreements have been entered into whereby if an owner wished to dispose of an apartment he must offer the stock to the other owners in the building; or must receive approval of the new purchaser by an owners' committee.

Some errors were naturally made in developing protection on too high a basis. For instance, in one co-operative apartment-house project it was agreed that no owner would sell an apartment except with the unanimous consent of the other owners. As years passed the section grew undesirable for residential purposes, and one owner after another wished to move and accordingly wished to dispose of his apartment. It happened that one apartment was owned by two spinsters who had very decided ideas against moving and could never be induced to give their consent to the sale of apartments. Thus it happened that this building gradually became vacant, and no apartments could be transferred until death finally removed the main objectors.

Conditions that Govern Success

It must, of course, be realized that with the advanced cost of building and changed conditions in financing, a co-operative building project is not the same problem as it has been in the past; and that the rules in the past serve more as guides than standards to be applied to-day.

In the following issue of THE ARCHITECTURAL FORUM a general outline will be given of what seems to be the more advanced thought and decision regarding the financing and maintenance of co-operatively owned buildings. Before entering, therefore, into a detailed consideration of practical methods of to-day, we may review the suggestions of the past as a basis on which to develop constructive thought for the future. Past experience shows:

1. That the best organizer of a co-operative venture is an interested individual — either an architect, a builder, a stock salesman or a real estate broker.

2. That the best manner to organize has been for a group of individuals to develop a prospectus of the operation, having sketch plans of the building drawn, and obtaining a tentative agreement from a loaning institution as to the amount of mortgage obtainable. At this time a stock company is formed capitalized for an amount equal to the necessary equity in land and building, with the stock all common and non-assessable.

3. That definite decision be made as to the amount of rentable space; and a general rule has been developed that the percentage of rentable space in a building should be approximately equal to the ratio of the first mortgage obtainable against the total necessary investment. Thus where a first mortgage of 60 per cent of the cost of operation has been obtained, approximately 60 per cent of the available space for renting should be rentable at market values to non-owners; the balance of 40 per cent of space then to be divided among the owners in square feet according to the amount of stock subscription.

4. That all details of management and operation be placed in the hands of a dependable real estate management organization, and the general details of this arrangement and all matters pertaining to the business of the building be handled by a small committee of stockholders, consisting of a board of directors of the corporation.

5. That a definite owner's rental be established and collected, in order that in addition to the total income from rented space there be an income from the owner's space which is sufficient to offset any deficiency and to provide a sinking fund for mortgage retirement. In this manner the owner pays an average of one-third the market value in rental, and his rental saving represents good interest on the amount of money invested. At the same time if land is improving in value and mortgage is being reduced, his stock is growing in value.

6. That the owners of such a building be of congenial type, sufficiently broadminded to operate in harmony, and that restrictions on the introduction of new ownership be sufficient to maintain an agreeable relationship, but at the same time not so stringent that an *impasse* may be created from a business viewpoint.

Italian Renaissance Details

A COLLECTION OF MEASURED DRAWINGS BY WM. D. FOSTER

THE doorway to the church of S. Maria delle Grazie at Brescia is not only very pleasing in proportion but is quite remarkable for the excellence of its detail.

The arabesques on the pilasters and the ornament on the colonnettes are remarkably fine. The carving shows the tool marks quite distinctly, the sharpness of the work giving an appearance almost as of wood carving. The general color is a creamish white, which is relieved by the inserts of colored marbles in the lozenge-shaped spaces in the arabesques; the base moulding is also of a bluish marble, while the two lions of an earlier period are of Sienna marble.

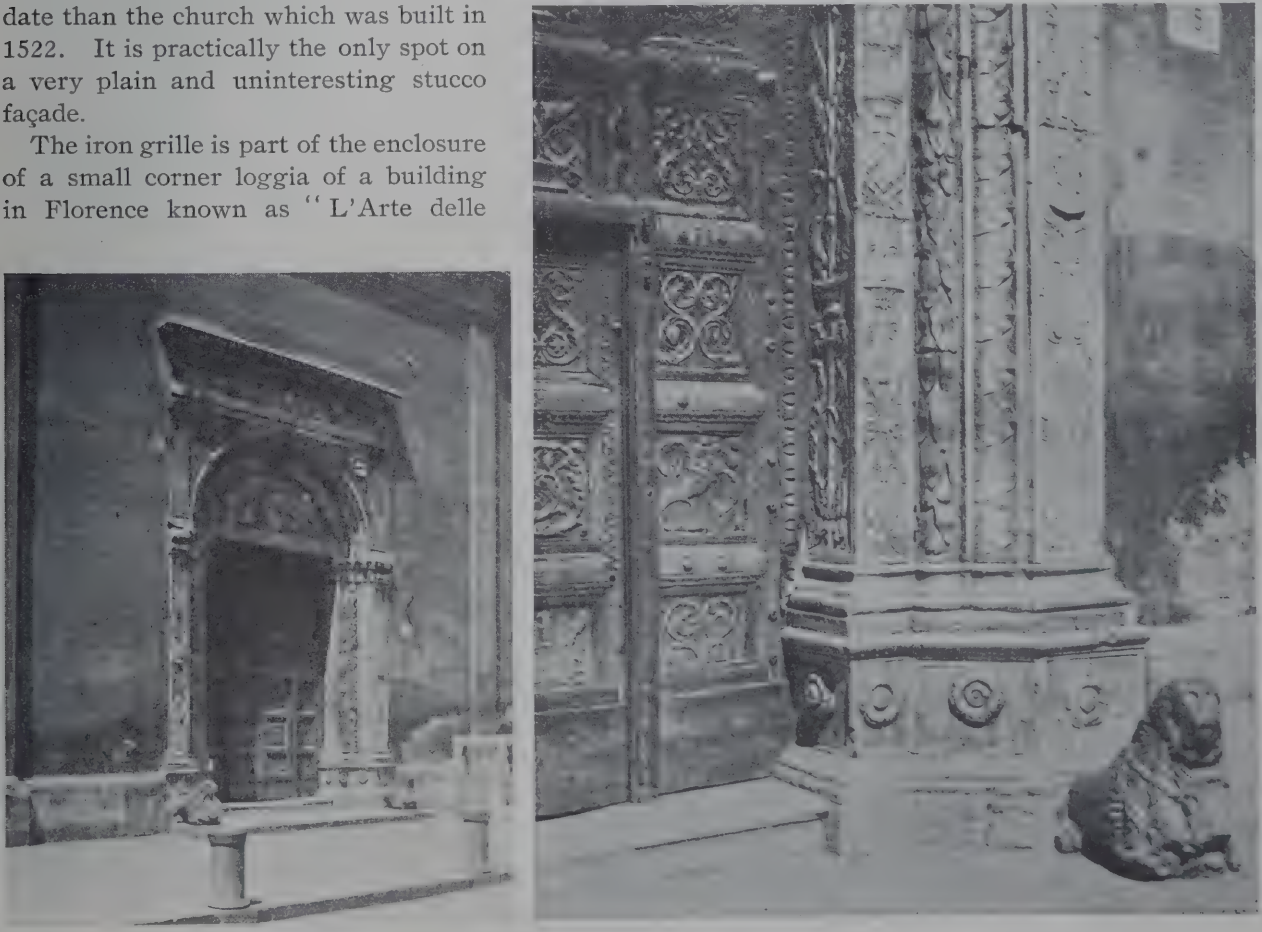
The wooden doors are also very beautifully carved and ornamented with bronze buttons on the stiles and rails. The carving here as on the marble is very sharp and well preserved. Stained dark, the doors give the appearance of being of bronze rather than of wood.

This doorway probably is of an earlier date than the church which was built in 1522. It is practically the only spot on a very plain and uninteresting stucco façade.

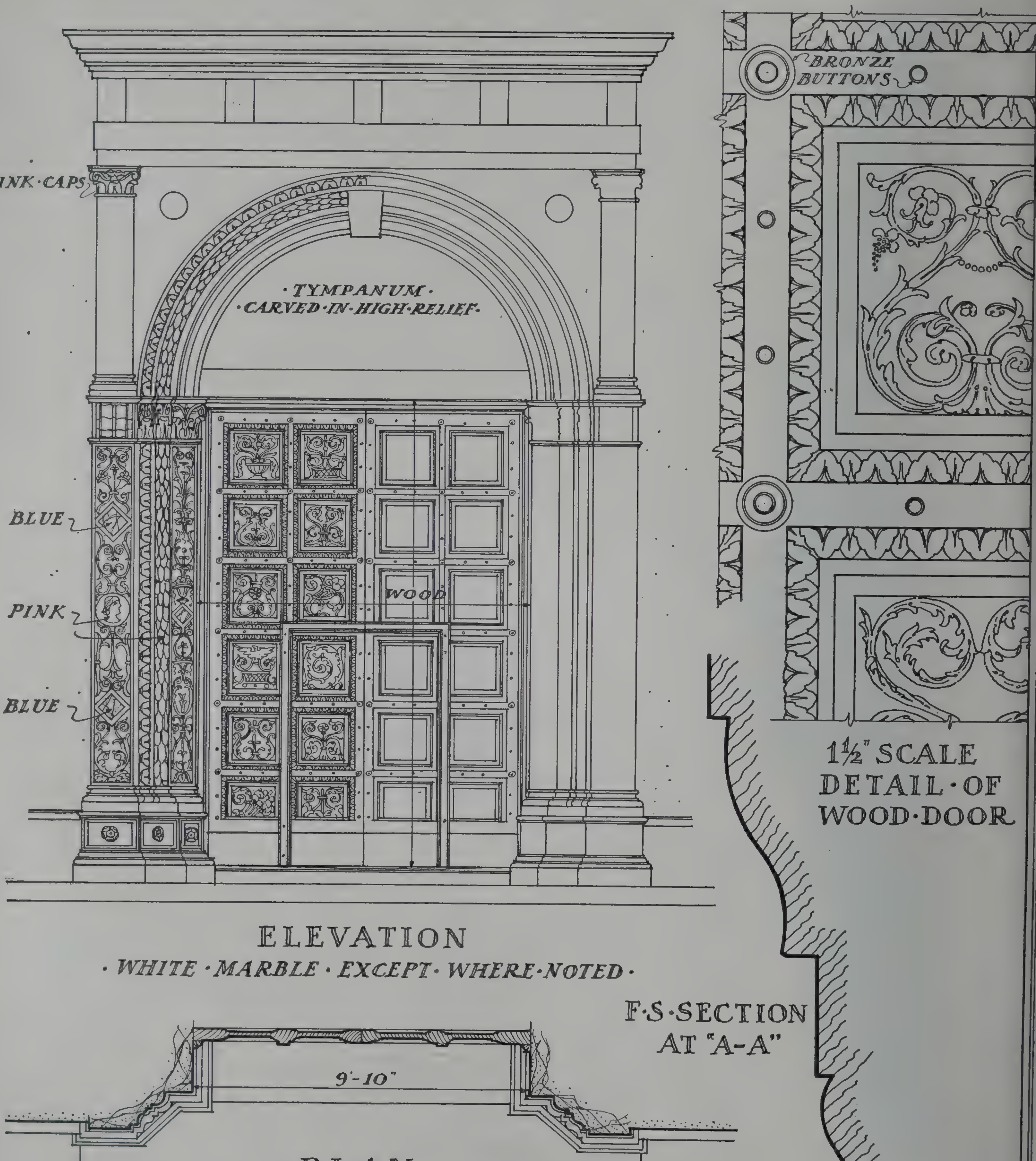
The iron grille is part of the enclosure of a small corner loggia of a building in Florence known as "L'Arte delle Lana," on the Via Calmara and exactly next to Or San Michele. It is typical of many similar grilles or gates in various parts of central Italy.

The frame and dividing bars are particularly interesting, being built up of simple strips of iron so as to give a very rich effect. It is now the entrance to a florist's shop which occupies the ground floor of the building.

The garden of the Villa d'Este at Tivoli is one of the most interesting in Italy. Due to its location on the side of a hill and the consequent fall of water, the garden is filled with "water motifs," pools, fountains, "water organs" and the unusual balustrade of fountains shown here. These fountains flank either side of the two secondary flights of steps in the central part of the garden. The width of the steps is about 14 feet and the flight is about 50 feet long, that is, there are seven divisions, similar to the one which is shown in the measured drawing on page 247.



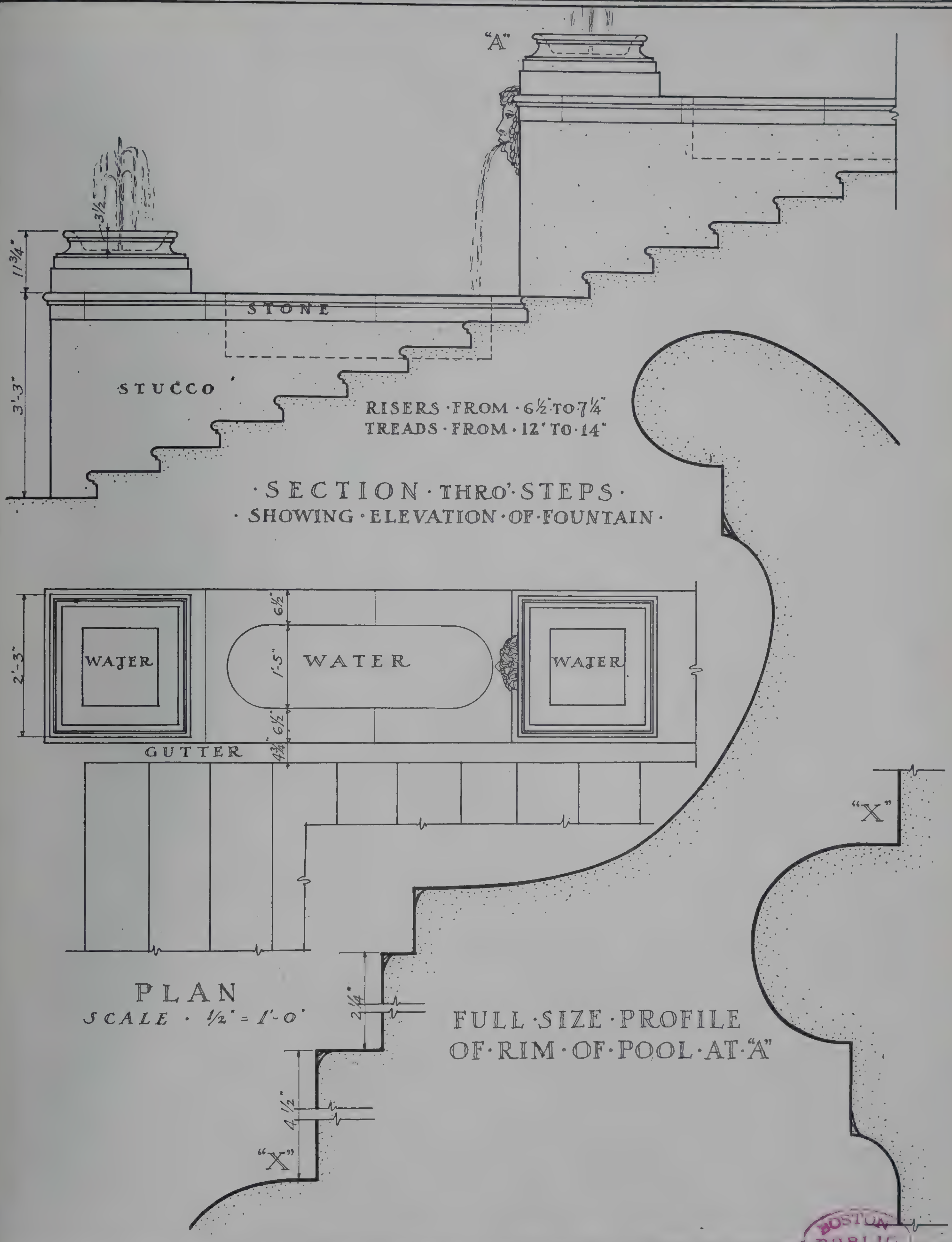
Portion of Façade and Detail of Doorway, Church of S. Maria delle Grazie at Brescia



ITALIAN
DETAILS
1920

·DOORWAY·
·S·M·DELLE·GRAZIE·BRESCIA·

MEASURED and
DRAWN by
WM·D·FOSTER



·SECTION · THRO' · STEPS ·
· SHOWING · ELEVATION · OF · FOUNTAIN ·

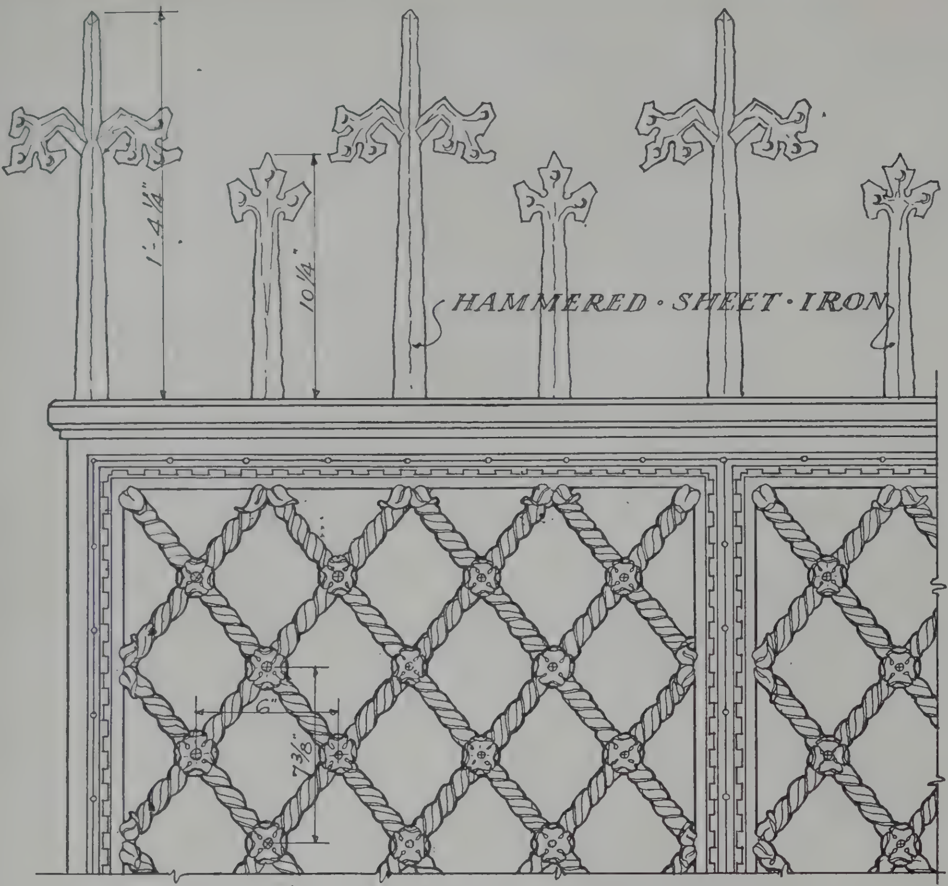
PLAN
SCALE · ½" = 1'-0"

FULL · SIZE · PROFILE
OF · RIM · OF · POOL · AT · "A"

ITALIAN
DETAILS
1920

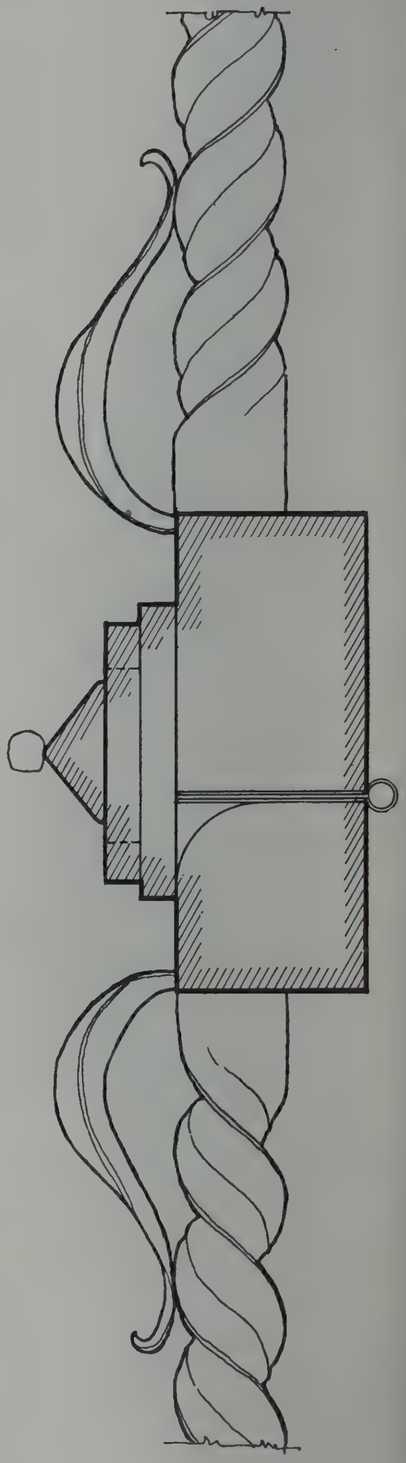
· "BALUSTRADE" · FOUNTAINS ·
· GARDEN · OF · THE · VILLA · D'ESTE ·

MEASURED and
DRAWN by
WM · D · FOSTER



· 1½" · SCALE · DETAIL ·

ELEVATION
SCALE · ½"=1'-0"



F · S · DETAIL ·
OF · MEETING ·
RAIL · AND · BAR

ITALIAN
DETAILS
1920

· IRON · GRILLE · AND · GATES ·
· L'ARTE · DELLA · LANA · FLORENCE ·

MEASURED and
DRAWN by
WM · D · FOSTER

Architectural Acoustics

RECENT TESTS AT THE UNIVERSITY OF ILLINOIS INDICATE THE SOUND-PROOFING EFFICIENCY OF THIN METAL LATH AND PLASTER PARTITIONS

JUST as the watch through the ages has been evolved from a bulky timepiece of mammoth proportions to the thin, beautiful models of the present day, the building partition has been skeletonized from the heavy ponderous walls of the Middle Ages to the space-saving partition of modern engineering efficiency. While the thin watch was developed because of excessive weight and unattractiveness of the older style, the 2-foot wall of centuries ago has been decreased to one-twelfth of that thickness by the demands of the present era.

An essential in determining the choice of partition types is the relative degrees of soundproofness, and while certain theories that have developed from the results of practical experience have been used as guides, the tests recently conducted at the University of Illinois offer architects a careful and scientific analysis of the subject that promises greater certainty of satisfactory results.

The solid metal lath partition 2 inches thick has for many years been a recognized factor in all insulations where economy of floor space was vital. The choice of this type particularly for its acoustic advantages has not been so general, for the transmission of sound through a thin wall is the point on which some few architects have felt a bit of hesitancy. It has been known, of course, since the inception of the solid metal lath partition, that ordinary measurements by the ear indicated that but little sound could pass. Comparisons, however, of the exact amount of sound passing through the walls in relation to that passing through thicker types of partitions were impossible to determine, due to the unreliability of the ear in measuring these quantities and the varying conditions naturally encountered in different buildings which made anything but a scientific comparison of no value. Hence, the architect has sometimes been guided by arguments based upon incorrect theory and scientific untruth. To get accurate results meant the exploration of unknown fields. The results of the tests recently completed by Prof. F. R. Watson of the University of Illinois proved the incorrectness of former ideas relating to the sound-proof qualities of partitions, and a detailed discussion is presented herewith because of the importance and interest attached to the subject.

Waste space in times past, little considered, has become of extreme value because of the present high cost of building. Comparing 2-inch solid partitions with 3-inch blocks plastered ½ inch on each side, there is a saving of floor space of 3,500 square feet in a typical 500-room hotel. This saving is equivalent to about 10 rooms, with a rental value of at least $50 per day. This extra economy is equivalent to about $18,000 per year, or 6 per cent interest on over $300,000. This is practically all profit.

If the acoustic properties compared favorably with the 3- or 4-inch partitions, the problem would be solved. Up to a few years ago only the fundamentals of sound transmission were known to men who had spent years in investigation. It was generally accepted that the acoustics in theaters depended on hangings, on the curve of the proscenium, etc., and it had already been determined that even a veil or fine meshed curtain would effect a notable difference in the ability of partitions to impede sound. Very little accurate information had been obtained, and Professor Watson's results will, therefore, be of benefit in establishing standards of practice on the sound insulation of partitions.

With but three or four fundamentals similar to those cited above, Professor Watson started investigations in November, 1918. Many months were spent in perfecting instruments which would positively measure the various amounts of sound which came through the walls. The Rayleigh resonator, adjusted to a sensitivity calculated to be capable of measuring the minuteness of the sound transmitted through various partitions, was the instrument finally adopted. It consisted of a brass tube in which was suspended, by a quartz thread, a mirror which moved at an angle relative to the intensity of the sound entering the brass tube. The amount of deviation caused a spot of light to move on a scale, and thus, by means of mathematical calculation, the exact amount of sound could be determined independently of the ear. The delicacy of the instrument may be appreciated when it is known that it will respond to a force that would require four hundred and sixty-five years to raise a sheet of writing paper one foot in the air. The resonator was of the same order of sensitiveness as the human ear, thus giving a reliable instrumental substitute for the latter, since the ear is untrustworthy for quantitative measurements of the intensity of sound.

Because of the different kinds of partitions which were to undergo tests, standardization was the

key necessary to the accuracy of results. The equipment for the test was worked out in detail beforehand, so that no change in conditions was necessary.

The experiments were conducted in two basement rooms separated by two isolated 9-inch brick walls, the ceiling and floors being of concrete, the latter supporting a wooden floor. The double wall between the rooms was cut through and the plaster partition under test was built in this space solidly. In order to keep the sound absolutely constant, a modified organ pipe was especially designed for the test. It was adjusted to give a pitch of one octave above middle C, and was blown by air from a standard pressure tank. This sound is of the quality and pitch usually found in inhabited buildings. The mouth of the organ pipe was located at the focus of a reflector, so that practically all of the sound was directed toward the partition under test. In this way an effect was obtained similar to that resulting from a searchlight.

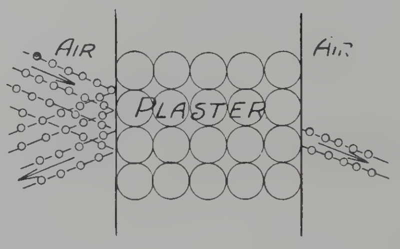


DIAGRAM ILLUSTRATING RELATIVE INERTIA OF SOUND WAVES AND PLASTER PARTITION

Diagram 1

In order that the bulk of the sound be directed against the partition under test, the reflected sound was largely absorbed by padding. So careful and intricate was the work that it required about two years from the first study of the problem to perfect the apparatus and complete the test.

Four distinct tests were successfully carried to completion, comparative measurements on the amount of sound passing through partitions of successive thicknesses of plaster covering and of the following constructions:

1. So-called "hollow partition" plastered on both sides with blocks as manufactured.
2. Same blocks with all holes filled with the same material out of which the blocks were made.
3. Solid plaster partition with metal lath core.
4. Solid plaster partition with plaster board core.

The partitions were erected by expert journeymen mechanics according to the usual practical methods. The same plaster was used on all samples.

A preliminary test of a thin coating of gypsum plaster on one side only of metal lath indicated a degree of insulating value of the plaster equivalent to ten layers of outing flannel. When the plaster coat was increased to one-half inch in thickness the resonator showed a deflection about one-sixth as great as for the thinnest coating. The later experiments were to determine the most efficient thickness of plaster partitions and to learn the relative effects of different partition cores.

Block Partitions. Block partitions have been widely used for a number of years. These blocks have air spaces in them which have been looked upon as aids in securing sound proofness. From a scientific standpoint dead-air space is an efficient sound deadener, but in these blocks the air spaces are not continuous; they are broken by connecting links of the block material, and in the tests under discussion the results show that the bridged openings are a detriment to sound proofing rather than a help.

Tests were conducted with the usual 3-inch plaster block partition, plastered both sides, and also with a partition built with similar blocks with the hollow spaces filled with the same material from which the blocks were made and plastered both sides as in the previous instance. The results obtained by the instrument reading were as follows:

Three-inch plaster block partition, plastered on both sides and with holes filled in with plaster — relative intensity of transmitted sound 1.16.

Three-inch plaster block partition, plastered on both sides, with holes left as manufactured — relative intensity of transmitted sound 3.85.

Solid Partitions. The foregoing tests proved the greater efficiency of solid partitions over those with hollow bridged spaces. The later tests considered two types of solid partitions, one with a metal lath core and the other with a plaster board core. Both partitions were tested after plaster coats had been successively applied till the thickness of each partition was 2 inches. The results of this comparative test showed the following:

Solid metal lath and plaster partition — relative intensity of transmitted sound 0.93.

Plaster board and plaster partition — relative intensity of transmitted sound 2.33.

In all engineering problems there is a size greater than which it is not economy to build. For many years it has been customary to make solid metal lath partition 2 inches thick; there was no scientific or theoretical structural reason for this thickness — it was the result of practical experience. One purpose of the test was, therefore, to determine scientifically the minimum thickness of plas-

ter partitions at which sound proof efficiency was reached. This was determined by starting the readings of the transmission of sound with the thinnest layer of plaster possible to lay on the metal lath and plaster board which constituted the respective cores of the two types of partition used for this particular test. The plaster was put on in successive coats until a total thickness of 2½ inches was reached for each of the partitions.

At about 2 inches in thickness it was apparent that the metal lath partition had fully developed the efficiency of the plaster. The plaster board partition, on the other hand, at 2½ inches thick did not show as effective sound insulation as the metal lath partition at 1⅝ inches.

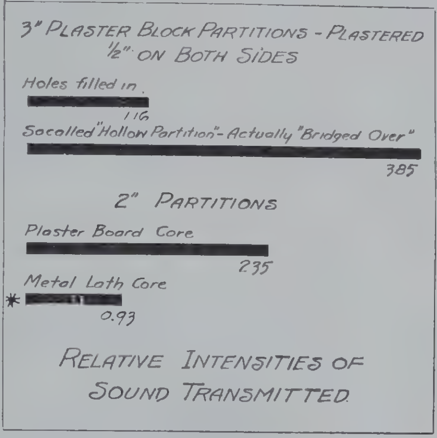


Diagram 2

The readings indicate that sufficient sound deadening qualities are had with a plaster partition with metal lath core at a thickness of 1½ inches. The full efficiency of the plaster is had at 2 inches, and for structural reasons, particularly on long and high partitions, it would seem desirable to maintain the 2-inch thickness as standard.

Professor Watson finds several reasons for the insulating value of the solid metal lath partition. To explain the results obtained through his scientific experiments we quote directly from his report:

“The superiority of the metal lath and plaster partition is doubtless due to several qualities. The metal lath core, because of its open mesh, not only allows the construction of a homogeneous plaster medium that is continuous from one face through the metal lath to the opposite face, but it also reinforces the partition. It has, therefore, the desirable quality of inertia with increased rigidity.

“The superiority of the plaster block partition with plaster filled air holes over a similar partition with open air spaces would appear to be due to increased weight or inertia. Both of these partitions appear at a disadvantage because of the lack of homogeneous structure. Buttering the joints with plaster, particularly at the ends of the blocks, does not always insure continuity of plaster and thus leaves possible cracks or channels through which sound may pass. This would also tend to weaken the partition compared with one in which the joints were completely filled.

“Other conclusions might be set forth, but the illustrations cited are sufficient to show the degree of concordance between theory and experiment.”

The theory of sound waves and their transmission through different media on which the tests were based is explained by the following quotations from Professor Watson's report:

“Sound of a definite pitch consists of a regular series of alternate pressures and rarefactions that travel out from the source in spherical waves, each particle in the path of the sound moving back and forth with an oscillating motion. On meeting a second medium, the regular progression of the waves is disturbed. Part of the energy is thrown back in the form of reflected waves and part transmitted, the relative amounts depending on the change in elasticity and density of the second medium compared with the first.

“According to this conception, sound generated in a room may be transmitted elsewhere in a building in several ways:

“1. It may progress with considerable ease in the continuous air passage of a ventilator pipe, or through open doors and halls without encountering a new medium to reflect it. A similar transmission with diminished intensity may take place through threshold openings and partition cracks.

“2. Sound in a room may be transmitted through the partitions of a room, but with more or less difficulty, depending on the qualities of the structure. Thus the *inertia* of a partition plays an important part. On striking the heavy partition particles, the air particles of small weight are thrown back in much the same way that a tennis ball would be on striking a cannon ball.

“The partition particles are moved back and forth slightly by the incident pressures and rarefactions so that sound waves, greatly diminished, progress through the partition. Since the latter is thin compared with the wave length of the sound, all the particles in it may be thought of as moving simultaneously in the same direction; that is, the partition may be considered to move back and forth as a unit. This motion is carried to the air on the further side where diminished waves are set up that constitute a faint sound.

“In case the partition is limited in extent and fastened at the edges, as it must be in any form of partition construction, the sound pressures must overcome not only the inertia of the plaster but also its *rigidity* or its resistance to being distorted. A sound pressure applied perpendicularly to the surface causes a minute displacement, which is greatest at the center and zero at the edges, so that

the partition becomes slightly bulged with a small increase in area. The less a wall gives under such a force, the more efficiently will it stop sound. It should be remembered in this connection that the pressures due to sound are not static but are rapidly alternating pressures and rarefactions of very small amplitude. The displacement of the partition is so small for usual sounds as to be invisible to the unaided eye.

"Another factor affecting the transmission of sound through a partition is the character of the structure. A thick, homogeneous structure has the advantages of greater inertia and rigidity compared with a thin partition. The use of an air space completely separating two members of a double partition would have a marked action on sound and would stop, according to theory, many times more sound than a single partition whose thickness equals the sum of the thickness of the two members of the double partition. This is due to the abrupt change in elasticity and density from the plaster to air and *vice versa* from air to plaster as the sound strikes the second member. In case the air space is bridged over, as is usual in practical constructions at the ceiling and floor and at other points, this theoretical efficiency is greatly diminished because the vibrations travel easily along the paths afforded by the continuity of solid materials. The bridged-over partition thus should be considered as a unit and its efficiency in stopping sound judged mainly on its weight and rigidity.

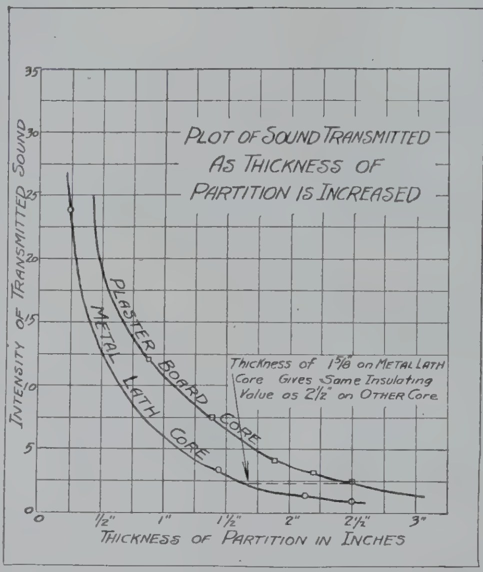


Diagram 3

"The core of a partition is another feature of structure that affects the transmission. It may be of such a nature as to increase the strength of the partition, or it may be simply the central part of a homogeneous medium, or it may be considered as separating the partition in two parts so that the structure is weaker than a homogeneous unit. A partition with increased strength due to the core, such as steel reinforcement, would be more rigid in stopping sound pressures than an equally thick homogeneous partition. The homogeneous partition in turn would be more efficient in stopping sound than the double partition weakened by the core. The latter, however, has some possible advantage in reflecting sound because of the change in elasticity and density in the core. An extreme illustration of this kind would be the case where the core was made of hairfelt so that the action in stopping sound would be analogous to an air space. If the core consisted of a sheet of thick paper, making a continuous contact with plaster on both sides with no air space, this efficiency would be largely lost and the small gain due to reflected sound would appear to be overcome by the loss in rigidity of the structure.

"Finally, the transmission of sound depends on the vibrations of the partition which acts in this regard like a thick elastic plate. The rapidly alternating pressures and rarefactions of the sound waves set the partition in minute motion and thus create corresponding pressures and rarefactions (sound waves) on the further side of the partition. The effect is intensified and the transmitted sound increased in volume if the natural period of the partition is in tune with the sound waves. The vibrations are usually small for ordinary sounds and partitions probably not exceeding 1/100 of an inch in amplitude. They decrease in intensity in walls of greater rigidity, other factors being the same.

"Theory and experiment both show that the transmission of sound through partitions is a complex phenomenon depending upon a number of factors such as inertia, rigidity, structure and vibration. It is difficult to draw comparisons from theoretical considerations for partitions that vary in several factors because the theory is admittedly incomplete.

"Experimental measurements in a situation of this kind appear to give the most direct evidence so that the results recorded here may be taken to represent the relative merits of the partitions."

DEPARTMENT OF ENGINEERING & CONSTRUCTION

CHARLES A. WHITTEMORE, *Associate Editor*

The Automobile and the Private Estate

PART III. THE DESIGNS OF DRIVEWAYS AND FORECOURTS

By TYLER STEWART ROGERS

THE design of entrance driveways and roads for private estates has not been materially altered by the introduction of automobile traffic. The primary modifications are greater width and broader, more open curves than were required for horse-drawn vehicles. These changes have been made in the interests of safety, due to the greater speed and inertia of motor cars.

Appearance is frequently a governing factor in determining the width of estate drives. Æsthetic satisfaction generally requires greater widths of roadway and smoother curves than the limitations of automobiles demand, hence we are fortunate in not often having to figure within very close limits in determining road design. In other cases the governing requirements will be unobtrusiveness, naturalness and grace of road line and surface, calling for the least possible road paving, the least grading and often frequent curves. Under these circumstances minimum width, sharp curves and heavy gradients are frequently involved in reaching a good solution.

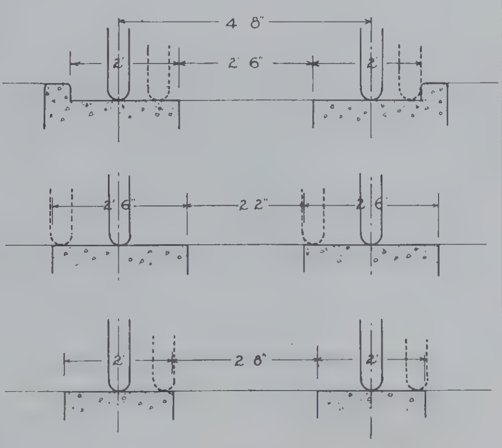


FIGURE 1

Minimum width of driveways is governed by the width of motor vehicles. Passenger vehicles vary in width from 5 ft. 4 in. to 6 ft. 4 in., with the average under 6 ft. Trucks vary from 6 ft. to 8 ft. in width. Automobiles "weave" more or less across a road surface and require greater surface than their actual width. Furthermore, if automobiles are confined to such a narrow surface that they cannot easily "weave," they quickly form ruts which soon destroy the pavement. These factors are involved in determining the width of road necessary for a single line of vehicles moving in one direction. Many opinions have been expressed, but it has now come to be more or less common practice to allow 9 ft. as the least practicable width for a one-way road surface.

If less width is essential, as in the case of approaches to suburban garages from the street to the rear of the lot where the property line is close to the house, it is advisable to lay a concrete pavement with rounded curbs to assist in keeping the car within the drive. In such cases it is possible to have the pavement only 7 ft. wide, but under no circumstances should the width be less than the extreme width of the vehicle. This minimum road width applies only to straight sections.

Two concrete runways are frequently used instead of solid pavements. Grass is planted between the runways to lessen the bareness of an otherwise ordinary pavement. Such runways should be laid 4 ft. 8 in. on centers for passenger vehicles when no curbing is used. If a curbing is desired a minimum overall distance of 6 ft. 6 in. to 7 ft. should be adhered to so that heavy coal, fuel oil or furniture trucks, some of which have a gauge as large as 6 ft. 1½ in., can pass along the pavement without injuring it. Since the gauge is measured to the center of the wheel, allowance should be made for the tread of the tires. Fig. 1 shows some suggested sections.

On curves a single roadway should be somewhat wider than the minimum dimensions just given. The "track" of automobiles increases beyond the normal gauge in proportion to the degree of curvature. When describing a circle of least radius the tracks of the inner rear wheel and the outer front wheel are sometimes as far apart as 9 or 10 ft., and the front fender extends beyond the outside line another foot or more. Increase in pavement width is generally necessary when runways or very narrow pavements are used in restricted areas. Driveways, except within turnarounds, seldom are so sharply curved as to require extra width.

With skilful driving and on straight sections,

automobiles can pass each other on a 14-ft. pavement. For estate roadways this is probably the smallest desirable width, and this figure should be used with caution. Narrow roadways should have wide, smooth grass berms free from obstructions, such as posts, trees or walls, so that in case of emergency cars may leave the pavement without danger of injury.

A more comfortable width of road and one more pleasant to drive over is 16 ft., while 18 ft. is very liberal, and dimensions greater than this need be selected only for æsthetic reasons. The need for three lines of traffic is seldom met in estate work.

Curves in driveways should be parabolic rather than circular. The gradual increase in the sharpness of the curve corresponds with the gradual turning of the steering wheel. Circular curves, especially on narrow roads, are hard to negotiate smoothly. Curves should also be governed by the grade. Sharp curves should never occur on steep grades.

On the outside of curves along embankments the edge of the road should be clearly defined. When the road surface is dark, and is bordered by grass without a curb, it is very difficult to see the road ahead at night, even with good lights, for frequently the trees and shrubs absorb so much light that they do not appear to be there. Birches, beeches, aspens or other trees or shrubs having very light bark or leaf color may be planted at such places to define the curve. Otherwise a white painted fence or a low wall having a light colored coping should follow the road completely around dangerous curves.

Roads may also be defined at night by illumination. Lighting suitable for estates is of three kinds: (1) that used merely to indicate the road surface; (2) that used to define objects on the roadway and (3) that used to clearly illuminate the roadway.

Many autoists prefer to drive over a dark road, depending on their headlights, rather than to have a line of bright lights along the side of the road. Within estates it is possible to overcome this difficulty by having the lights on very low pedestals, standing from a foot to 3 ft. above the ground, with the lamps concealed within reflectors, which cast the light directly out upon the road surface. This method clearly defines the road without producing any glare in the driver's eyes.

Another method of road lighting uses a few high, bright, but diffused sources, so spaced as to either illuminate an object beyond them or to throw an object between them and the approaching driver into distinct relief. For this purpose high candle power units in diffusing reflectors or globes are spaced a considerable distance apart at such locations that they may be seen quite a distance ahead. They are best suspended over the road and high enough to be out of the driver's eyes when he approaches close to them. Even the location of the light close to heavy foliage does not seem to diminish its effect. When carefully planned this system is the most economical, the safest and the most comfortable to drive by of any method yet devised. All objects are either (*a*) in relief against a bright background, (*b*) clearly illuminated by a nearby intervening light or (*c*) again in relief against the next source. A non-glaring light source of good strength is the principal requisite.

The third system of roadway illumination is similar to the so-called "White Way" method, consisting of a single row or parallel rows of elevated lights bordering the roadway sufficiently close together to clearly illuminate the whole pavement. This method is useful on private estates for formal approaches of some pretense, but has little merit other than its formality and brilliancy to warrant its great cost.

Condemnation cannot be too strong of the common use of exposed electric bulbs along the side of the roadway. This form of light has the maximum glare and the minimum of illumination and is more distressing than it is helpful. Such lights should invariably be fitted with diffusers or glare-reducers of good design.

Entrance courts and gateways are often desirable at the junction of a private driveway and a public road. When such an approach is sufficiently formal to require a gateway, care should be taken to set the posts well back from the street so that they will not constrict the curves at the sides of the junction. If the posts must be close to the street they should be set well apart.

The radius of the circle described by the inner rear wheel of an automobile which is turning in its least radius varies from 7 ft. to 17 ft. 8 in. The radius of the curbs at junctions of roads of minimum width should therefore be 18 ft. or more. This will enable a car to turn the corner very close to the curb, thus avoiding danger of collision with other passing vehicles.

It has been demonstrated, however, that an automobile making a 90-degree turn of this nature seldom reaches its minimum turning radius during the movement if traveling ahead uniformly. In practice this is not often a factor, as drivers do not actually follow the curb line, but approach a turn from nearer the center of the road. They nearly touch the curb at the center of the curve and then run out into the other road some distance. At junctions of narrow roads, or of a narrow drive with a highway, this practice becomes a menace, and demands relief by the provision of as liberal a radius as circumstances permit.

Some Economies in School Construction in Montreal

PART II. (Concluding Paper)

NOBBS & HYDE, ARCHITECTS

THE successful planning and construction of any kind of a building involves many close economies and a very careful use of space, which are the result of present costs and conditions. The building of schools means the use of public funds and this makes it more than ever necessary to secure the maximum of results at the minimum of cost.

The means by which several very practical school buildings have been worked out and their cost kept within the necessary limits involves several very interesting features.

IV. Corridor Finish

THROUGHOUT the series of schools under review the following corridor finish has been used. There is a cement dado to a height of 6 feet, with a base in red tile. The floors have 3-foot borders of terrazzo, the central area, 6 feet in width, being depressed ¼ inch and finished in cement over which is laid battleship linoleum. A galvanized iron fillet, set on edge at the inside of the border, protects the arris of the terrazzo from damage.

V. Class-Room Trim

THERE is a minimum of trim in the class rooms. At the window jambs the plaster is taken right in to the frames and the joint between is covered with a small cavetto. The sill aprons are continued by way of a chair rail. Below this there is a cement dado. A quarter round convex base takes the place of a skirting. The chalk rail to the blackboards is in wood, but the frame is formed of ¼- by 3-inch steel. The doors are of "slab" type, set in steel frames flush with the plaster and consequently there is no wood trim. In a number of schools, a standard rolled steel door frame was employed and this suited admirably, but in 1914, when the war made the utmost economy essential and the practice of the principle of "made in Canada" a duty, a door frame was made up by using 6-inch rolled steel channels with a stop bead of wood. This special frame was made at about half the cost of the imported article. For the internal wood finish red oak is used throughout.

VI. Lavatory Stalls

IN these schools the evolution of the lavatory stalls has been interesting. The stalls in the boys' lavatories called for most thought, as the school authorities insisted upon a construction such that the only possible means of access should be through the door. This requirement arose through a tendency among certain small individuals to bolt the doors in each of a row of stalls from the inside, a feat made possible by traveling along the tops of the partitions. These operations, of course, left a bad job for the janitor. The ordinary public lavatory stall with 6-foot 6-inch partitions and 12-inch floor openings and slatted doors would not do. After a number of experiments, which met with varied success, the following installation was devised and seems boy proof. (See Fig. 4.) The main frame is of 2-inch iron pipe. Stall divisions are ⅞-inch white marble to within 6 inches of the floor and 6 feet high. The marble

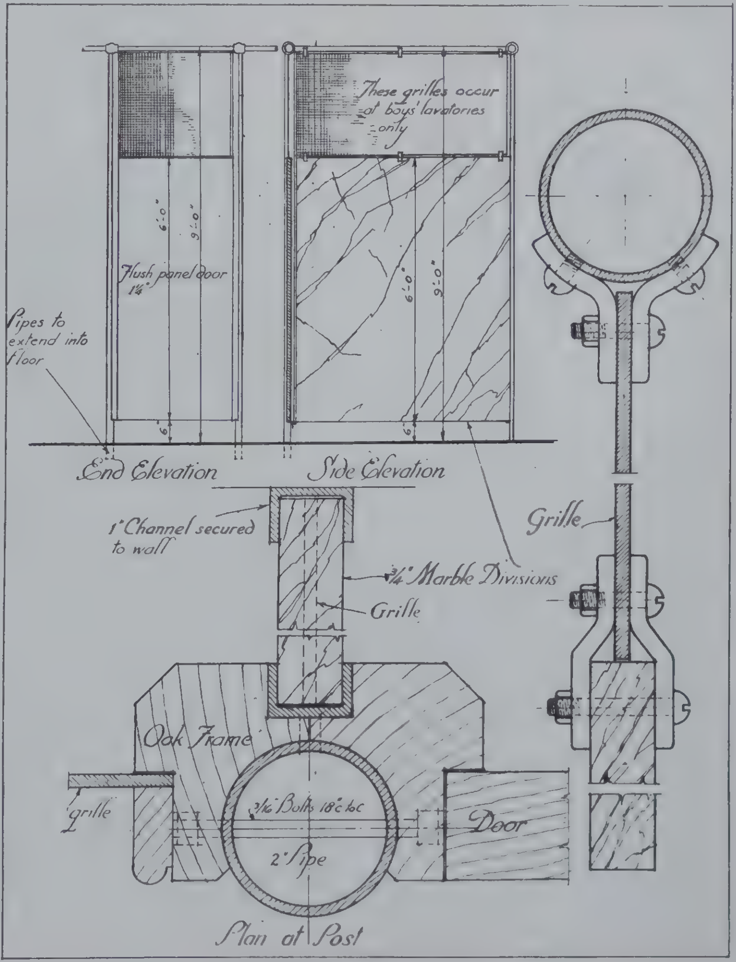


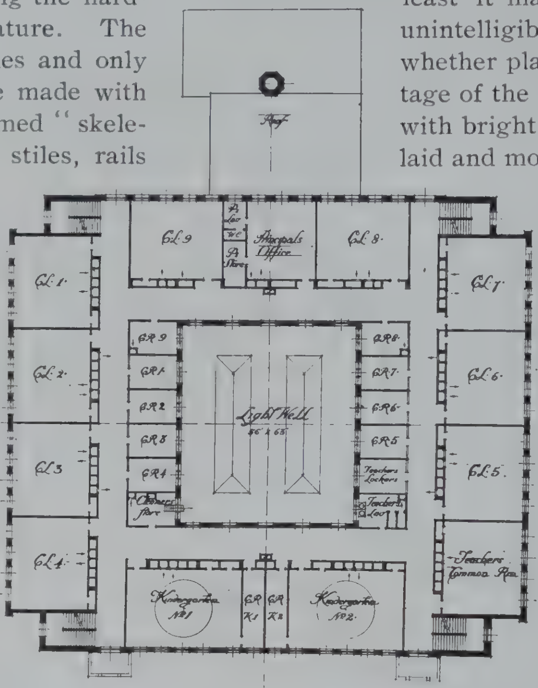
Fig. 4. Details of School Lavatory Stall Divisions

is carried in channel irons riveted to the pipe frame and bolted to the wall. The doors are hung in oak stops bolted to the pipe uprights. These stops are convenient for fixing the hardware; a very desirable feature. The doors are flush on both sides and only 1¼ inches thick. They are made with a core, which might be termed "skeleton," as it consists only of stiles, rails and cross braces. Above the doors and above the marble at the ends of ranges of stalls, white enameled cast-iron grilles extend to a height of 10 feet above the floor. Besides proving an efficient barrier this arrangement looks well and wears well.

VII. External Treatment

THE exteriors of these schools are, of necessity, treated in the simplest possible way. Care is taken to maintain the proportions of the prevailing types of windows as far as possible and to group the windows systematically so that if a certain dulness is inevitable at least it may not be a disagreeable or unintelligible dulness. The brickwork, whether plain or devised to take advantage of the contrasts of textured surfaces with bright pressed margins, is carefully laid and most carefully pointed with a flat keyed joint ¼ inch deep. The result aimed at is building without architecture, in the sense that conventional forms and arbitrary composition are entirely lacking. What symmetry and regularity is attained is merely the automatic expression of an orderly and economic plan, and a highly organic structural method.

Ornament and decoration are not entirely dispensed with, however. Occasional and sparing



First Floor Plan of Peace Centenary School

Peace Centenary School, Protestant Board of School Commissioners, Montreal, Canada
Nobbs & Hyde, Architects

use has been made of terra cotta mosaic panels and of cement reproductions of such things as Della Robbia's "Singing Choirs," Verocchio's "Boy with the Dolphin," etc., and occasional dedication panels in stone, and finials on the skyline.

Exterior View of Strathearn School, Montreal, Canada

VIII. Costs

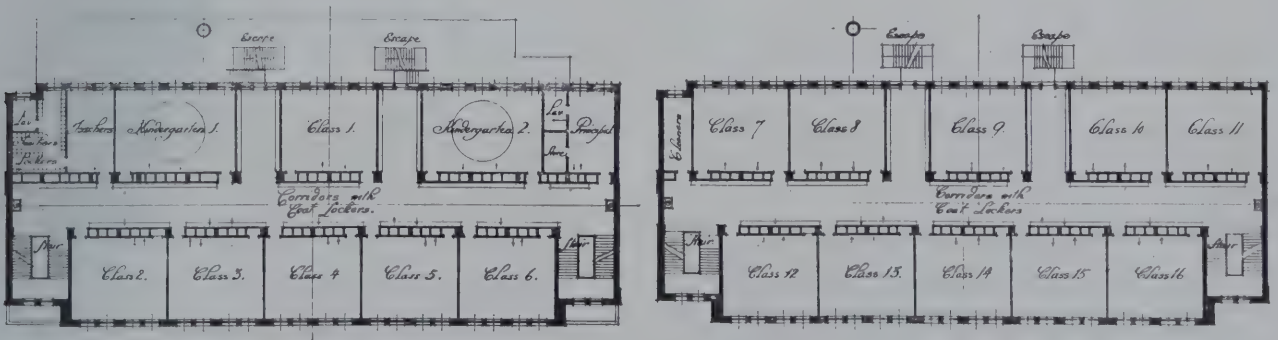
AS observed above, the efforts of the architects have been directed to the discovery of economic materials and methods of construction, the use of which would neutralize the steady increase in building costs and maintenance charges. The fruits of their efforts are set forth in the table below giving detailed costs on four schools, three of which are very similar in type.

In these compilations the height of the buildings have in all cases been taken at 64 feet — the dimension from a level two feet below the ground floor to the top of the roof coping. It will be noticed that the Strathearn school cubic foot cost is above the average, but the cost per pupil is regular. This is evidence of the close packed character of the plan. The Edward VII school was a two-story building.

These low cubic foot costs, which resemble values in factory or loft building construction, have not been obtained by the sacrifice of sound workmanship or good materials. The structures are as substantial and lasting as it is possible to make them and the engineering specifications provide for an equipment compatible only with highest standards of requirements and the most efficient results.

Comparative Table of Costs

	Edward VII	Strathearn	Peace Centenary	Bancroft
Common classes	22	26	31	29
Kindergarten	2	2	2	2
Sloyd	0	0	1	1
Cookery	0	0	1	1
Total class rooms	24	28	35	33
Boys' play room area, ft.	3,300	2,700	6,500	5,000
Girls' play room area, ft.	1,900	2,400	4,000	5,000
Gymnasium area, feet	2,000	2,100	3,600	2,200
Boys' urinals	18	41	58	34
Boys' water closets	16	17	36	26
Girls' water closets	16	31	58	35
Cubic contents, feet	931,000	873,000	1,434,000	1,250,000
Cost, general contract	$143,775	$168,000	$205,000	$181,000
Cost, engineering	$30,550	$33,500	$45,000	$41,000
Total cost	$174,325	$201,500	$250,000	$222,000
Cost per cubic foot	19c.	23c.	17.5c.	17.8c.
Cost per class room	$7,280	$7,150	$7,143	$6,700
Number of children	1,000	1,200	1,500	1,400
Cost per child	$174	$167	$167	$157
Date of completion	Sept.,'12	Sept.,'13	Sept.,'14	Sept.,'15



First Floor Plan

Second Floor Plan

Strathearn School, Montreal, Canada, Nobbs & Hyde, Architects

EDITORIAL COMMENT

THE INSTITUTE AND STATE SOCIETIES

AT the last convention of the Institute a subject to which a great deal of time was devoted and which drew out a general interest on the part of the delegates was the relation of state societies of architects to the Institute. It will be recalled that at the convention of the preceding year at Nashville a resolution was passed directing the Institute Board to encourage the organization of state societies. That this action was taken without a full understanding of its meaning may be inferred from the fact that since that convention at least five Chapters have recorded themselves as opposed to the organization of state societies.

The question is one, therefore, on which there is not a unanimity of opinion. There is unquestionably in the minds of both those opposed to and those in favor of state societies a common purpose — a sincere desire to see a larger membership in the Institute and the greater prestige and influence which would be derived from the resulting larger representation of the profession. Since both policies are assumed to lead to the same result, the question resolves itself into a choice of method.

It is generally recognized that a characteristic of our present social structure is a disregard for the established order of things. We have by no means recovered from the upsetting effects of war, and in our attempt to make the world over on a new pattern the favorite recipe seems to be the abandonment of past policies and the search for new ones without much thought as to their comparative merits — the mere quality of newness being a sufficient endorsement. There is, perhaps, some of this character unconsciously inherent in the present feeling for greater democracy in the Institute. With a condition to meet, the first impulse is to set up new machinery; but it would seem that before effort and money are expended in developing the new machinery a careful analysis should be made of existing facilities to determine in what degree they have failed, for is it not likely that the new attempt might have the same fundamental faults as the old, if such exist in the present organization?

The fundamental question is the means of securing greater representation of architects in a national body. It is proposed that state societies be established, in which all registered architects in states where registration laws are in force and all honorable practitioners in other states be admitted to membership in a local organization, which shall govern itself independently of any other association and in accord with local conditions. These state associations would have representation at the annual conventions of the Institute and would be presumed to act as training grounds for future Institute members. Their dues would be placed at a moderate figure so that no architect would refrain from joining because of the expense attached. The result, it is hoped, would be a series of strong local organizations that would advance the interests of the profession in the respective localities in accord with particular conditions that exist in them.

Since the existing state societies and the Institute have for all practical purposes the same objects, as pointed out by the various state society delegates who spoke at the last convention, would not the creation of a large number of new state societies be a duplication of work the Institute Chapters are now doing or could do if their number were sufficiently enlarged? With the desire for democracy supplied by the state societies, would not the Institute need to become, as some claim it it is now, an aristocratic body, accessible only to the few? Could there be any common ground of understanding between the Institute and these local organizations? Would not the inevitable sequel be the formation of a Federation of State Societies, setting up a spirited competition between itself and the Institute for members, but in other respects working along different channels?

Sufficient happenings have already occurred to indicate that instead of strengthening the Institute, which is the aim all seem agreed upon, the establishment of state societies has weakened the national body. The formation of the Indiana State Society was followed by the abandonment of the Indiana Chapter, and in New York the newly formed state society has resulted in giving up the New York State Association of Chapters. In an interesting compilation of data in the *Institute Journal* for May on the relation of state societies to the Institute Chapters prepared by Charles St. John Chubb, there appears to be Institute weakness in all states in which there are state societies with the exception of Illinois and Washington. This would indicate either that the state societies had been more aggressive in securing members or that they were more acceptable to architects as a form of organization. It is difficult in view of these statistics to see how a larger number of state societies would strengthen the Institute and increase its membership. The method of studying the present organization with a view to adapting the local chapters to meet present conditions would seem more feasible. Surely the same effort required to organize new state societies if applied to increasing chapter membership would strengthen the Institute directly and not subject it to the possible competition of another national body.

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